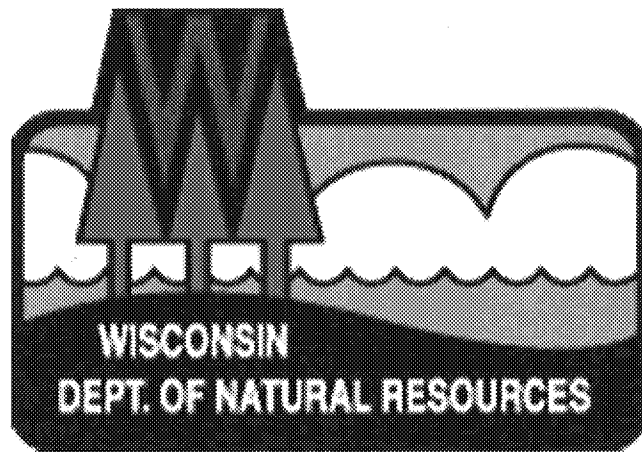


Wisconsin Department of Natural Resources 2019 Air Monitoring Network Plan

June 2018



Signature Page

By the signatures below, the Wisconsin Department of Natural Resources/Air Monitoring certifies that the information contained in this network document for sampling year 2019 is complete and accurate at the time of submittal to US EPA Region 5. However, due to circumstances that may arise during the sampling year, some network information may change. A notification of change and a request for approval will be submitted to US EPA Region 5 at that time.

Signature Kate Praed

Date 6/7/2018

Chief, Air Monitoring Section

Table of Contents

Public Notification and Comment Period	i
Disclaimer	ii
Summary of Significant Network Changes from the 2018 Annual Network Plan	iii
List of Tables	v
List of Figures	v
Acronyms, Abbreviations, and Definitions	vi
Introduction	1
Network Overview	1
Minimum Monitoring Requirements	1
Monitoring Objectives	1
Site Selection	2
Network Scales	2
Regional Network Assessment	3
Quality Assurance/Quality Control (QA/QC) Program	7
Data Processing and Reporting	7
Types of Networks	8
State and Local Air Monitoring Sites (SLAMS)	8
Special Purpose Monitor (SPM) Sites	8
Chemical Speciation Network (CSN)	8
Photochemical Assessment Monitoring Stations (PAMS)	8
National Air Toxics Trends Stations (NATTS)	9
National Core Monitoring Network (NCore)	9
National Atmospheric Deposition Program (NADP)	10
Near-Road Air Quality Monitoring	10
Interagency Monitoring of Protected Visual Environments (IMPROVE) Program	11
Industrial	11
Biowatch	11
Parameter Networks	14
Criteria pollutants	17
Particulate Matter	18
Lead (Pb)	26
Ozone (O ₃)	28
Nitrogen Dioxide (NO ₂)	32
Sulfur Dioxide (SO ₂)	34
Carbon Monoxide (CO)	36
Air Toxics	38
Metals	38
VOCs, Carbonyls and PAHs	38
Atmospheric Deposition	38

Acid Deposition	38
Mercury (Hg) Deposition	39
Atmospheric Mercury Network (AMNet)	39
Ammonia Monitoring Network (AMoN)	39
Meteorological Data	44
Network Changes	46

Public Notification and Comment Period

The annual monitoring network plan details the operation and locations of ambient air monitors operated by the Wisconsin Department of Natural Resources (DNR) Air Monitoring Section. Pursuant to federal requirements (40 C.F.R. 58.10(a)(1)), the DNR will provide a 30 day public comment period for review of this ambient air quality monitoring network plan. Written comments on this monitoring network plan document may be submitted no later than June 2, 2018 directly to:

Ms. Katie Praedel,
c/o Air Monitoring Section, Bureau of Air Management,
P.O. Box 7921,
Madison, WI 53707,

Written comments will have the same weight and effect as oral comments presented at the meeting. A copy of the proposed revision to the Monitoring Plan is available for public inspection at the Bureau of Air Management, 7th Floor, 101 S. Webster Street, Madison, Wisconsin, on the following web address: <http://dnr.wi.gov/topic/AirQuality/Monitor.html> or by mail (at no charge) from Ms. Katie Praedel at the address noted above.

Disclaimer

The network design proposed in this document represents a balance between the desired number of monitors and monitoring frequency; and expected funding levels. The desired network configuration considers monitoring history, population distribution, federal monitoring requirements under the Clean Air Act, 40 Code of Federal Regulations (CFR) Part 58 and expected staffing levels.

Recommended changes to this network will be implemented during the May 2018 through December 2019 time period, contingent upon adequate funding levels.

Network operations may change during the years without public notice based on unexpected circumstances. Examples of unexpected circumstances include catastrophic equipment failure, construction or demolition activities, loss of site access, or monitor obstructions.

Summary of Significant Network Changes from the 2018 Annual Network Plan

A = Addition

M = Modification or adjustment

T = Termination

1= FRM

2 = Designated FEM as primary in Sept 2017

3= Designated FEM as primary in Jan 2018

4 = BAM

5 = NO₂ monitor

Monitoring Site	AQS Site ID	Site	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Meteorological	Pb-TSP	Metals (PM10)	NO _y	PCB	PAH	VOC / Carbonyl	Hg	CSN	AMNet	AMoN	MDN	NTN	IMPROVE	Description
Appleton AAL	55-087-0009			M2&T1																				Termination of FRM in Sept 2017.
Bad River Tribal School – Odanah	55-003-0010																							
Chiwaukee Prairie Stateline	55-059-0019			M2&T1																				Termination of FRM in Sept 2017.
Columbus	55-021-0015																							
Devils Lake	55-111-0007			M3&T1																				Termination of both FRMs in Apr 2018.
Eau Claire-DOT Sign Shop	55-035-0014			M3&T1																				Termination of FRM in Apr 2018.
Expera Thilmany	55-087-0015																							
Green Bay East High	55-009-0005			M3&T1																				Termination of both FRMs in Apr 2018.
Harrington Beach	55-089-0009			M2&T1																				Termination of FRM in Sept 2017.
Horicon Wildlife Area	55-027-0001			M3																				
Kenosha-Water Tower	55-059-0025																							
Kohler	55-117-0008																							
La Crosse	55-063-0012			M3&T1																				Termination of FRM in Apr 2018.
Lake DuBay	55-073-0012																							
Madison - East	55-025-0041			M3																				
Madison -University Ave. Well #6	55-025-0047																							

List of Tables

Table 1: Network Scales	3
Table 2: Site Information – Wisconsin Sites Active in 2018	4
Table 3: Near-Road Parameters	11
Table 4: Industrial Monitoring Sites in Wisconsin*	13
Table 5: 2017 Site Parameters.....	15
Table 6: Methods and Equipment	17
Table 7: National Ambient Air Quality Standards (NAAQS)	18
Table 8: FRM Monitors Sampling Frequencies ¹	22
Table 9: 2018 Metals Monitored in Wisconsin.....	38
Table 10: 2018 VOCs Monitored in Wisconsin	41
Table 11: 2018 Carbonyls Monitored in Wisconsin.....	42
Table 12: 2018 PAHs Monitored in Wisconsin	42
Table 13: Proposed Network Changes (May 1, 2018 - December 31, 2019)	47

List of Figures

Figure 1: 2018 Air Monitoring Sites in Wisconsin	6
Figure 2: 2018 PM _{2.5} Monitoring Sites in Wisconsin.....	21
Figure 3: Daily PM _{2.5} Average Concentrations at Continuous Sites in January 2017 Need new version	23
Figure 4: Annual PM _{2.5} Concentrations Compared to the NAAQS Based on 2015-2017 – Need new version.....	24
Figure 5: 24-hour PM _{2.5} Concentrations Compared to the NAAQS Based on 2015-2017 Need new version	25
Figure 6: 2018 PM ₁₀ Monitoring Sites in Wisconsin	27
Figure 7: Max 24-hour PM ₁₀ Concentrations Compared to the NAAQS Based on 2015-2017 Need new version ...	28
Figure 8: 2018 Ozone Monitoring Sites in Wisconsin.....	30
Figure 9: 8-hour Average Ozone Concentrations Compared to the NAAQS Based on 2015-2017 Need new version	31
Figure 10: 2018 Nitrogen Dioxide Monitoring Sites in Wisconsin.....	33
Figure 11: 2018 Sulfur Dioxide Monitoring Sites in Wisconsin	35
Figure 12: 1-hour Sulfur Dioxide Concentrations Compared to the NAAQS Need new version.....	36
Figure 13: 2018 Carbon Monoxide Monitoring Sites in Wisconsin	37
Figure 14: 2018 Air Toxics Monitoring Sites in Wisconsin.....	40
Figure 15: 2018 Atmospheric Deposition Sites in Wisconsin	43
Figure 16: 2018 Meteorological Sites in Wisconsin.....	44

Acronyms, Abbreviations, and Definitions

AADT – Annual Average Daily Traffic
AIRMoN – Atmospheric Integrated Research Monitoring Network
AIRNow - air quality forecasting program
Air Toxics – suite of parameters that includes VOCs, carbonyls, and metals
AMNet – Atmospheric Mercury Network
AMoN – Ammonia Monitoring Network
AQA – Air Quality Advisory
AQI – Air Quality Index
AQS – Air Quality System: EPA's repository of ambient air quality data
BAM – Beta Attenuation Monitor
BTEX – Benzene, toluene, ethylbenzene and xylene
CAA – Clean Air Act
CAL – Central Analytic Lab
CAS – Chemical Abstracts Service
CASTNET – Clean Air Status and Trends Network
CBSA – Core Base Statistical Area
CFR – Code of Federal Regulations
Class I area – remote area with pristine air quality
CO – carbon monoxide
Criteria Pollutants – the six pollutants regulated by the 1970 Clean Air Act (particulate matter, ozone, nitrogen dioxide, sulfur dioxide, carbon monoxide, and lead)
CSN – Chemical Speciation Network
ECD - Electron Capture Detector
EPA – United States Environmental Protection Agency
FCPC - Forest County Potawatomi Community
FE-AADT – Fleet Equivalent Annual Average Daily Traffic
FEM – Federal Equivalent Method
FRM – Federal Reference Method
GC/MS – Gas Chromatography/Mass Spectrometry
HAP – Hazardous Air Pollutant
Hg – mercury
HPLC – High Pressure Liquid Chromatography
ICAP-AES – Inductively Coupled Plasma Atomic Emission Spectrometry: a technique used for metals analysis
IMPROVE - Interagency Monitoring of Protected Visual Environments
LADCO – Lake Michigan Air Directors Consortium
MDN – Mercury Deposition Network
MOA – Memorandum of Agreement
MSA – Metropolitan Statistical Area
NAAQS – National Ambient Air Quality Standard
NADP – National Atmospheric Deposition Program
NATTS – National Air Toxics Trends Stations
NCore – National Core Monitoring Network
NTN – National Trends Network
NH₃ – ammonia
NO – nitric oxide
NO₂ – nitrogen dioxide
NO_x – oxides of nitrogen
NO_y – reactive oxides of nitrogen
NPAP – National Performance Audit Program

NTN – National Trends Network
O₃ – ozone
PAH – Polycyclic Aromatic Hydrocarbon
PAMS - Photochemical Assessment Monitoring Stations
Pb – lead
PCB – Polychlorinated Biphenyl
PEP – Performance Evaluation Program
PFC – perfluorochemical
PM_{2.5} – particulate matter less than 2.5 microns in diameter (fine particulate matter)
PM_{10-2.5} – particulate matter between 2.5 and 10 microns in diameter (coarse particulate matter)
PM₁₀ – particulate matter less than 10 microns in diameter
ppb – parts per billion
ppm – parts per million
PQAO – Primary Quality Assurance Organization
QAPP – Quality Assurance Project Plans
QA/QC – Quality Assurance/Quality Control
QMP – Quality Management Plan
SIP – State Implementation Plan
SLAMS – State and Local Air Monitoring Stations
SO₂ – sulfur dioxide
SPM – special purpose monitoring
STN – speciation trends network
TO-9A – EPA method for analyzing PCBs using GC with ECD
TO-11A – EPA method for analyzing carbonyls utilizing HPLC
TO-13 – EPA method for analyzing PAHs using GC/MS
TO-15 – EPA method for analyzing VOCs utilizing GC/MS
tpy – tons per year
TSP – total suspended particulate matter
UAT – Urban Air Toxics
USG – unhealthy for sensitive groups
USFS – United State Forest Service
VOC – Volatile Organic Compound
DNR – Wisconsin Department of Natural Resources
WINS – Well Impactor Ninety-Six
WSLH - Wisconsin State Lab of Hygiene

Introduction

In 1981, the U.S. Environmental Protection Agency (EPA) approved a portion of the Wisconsin State Implementation Plan (SIP) for the Clean Air Act monitoring plan which addresses air quality surveillance, and is required by Parts 53 and 58 of Title 40 of the Code of Federal Regulations.

The Wisconsin Air Monitoring Network Plan is an annual report required under the Code of Federal Regulations (40 CFR 58 § 58.10(a)(1)). Beginning July 1, 2007, state agencies are required to submit an annual network plan of SLAMS, NCore, STN sites, CSN sites, SPM sites and PAMS sites, if they exist. The plan must include a statement of the purposes for each monitor and evidence that siting and operation of each monitor meets the requirements of 40 CFR Part 58 Appendices A, C, D, and E. In addition, the plan must be made available to the public for at least 30 days prior to its submission to EPA.

The goals of this plan are to provide evidence that the Wisconsin Department of Natural Resources (DNR) air monitoring network meets current federal monitoring requirements, to detail any changes proposed for the 18 months following publication, to provide specific information on each of the DNR's existing and proposed monitoring sites, and to provide the opportunity for the public to comment on air monitoring activities conducted by the DNR. The plan also includes information on known industrial monitoring activities and information on air toxics monitoring in the state.

The DNR's air quality data are used to determine compliance with National Ambient Air Quality Standards (NAAQS). In 1970, the Clean Air Act (CAA) established NAAQS for six pollutants known to cause harm to human health and the environment. The CAA requires the DNR to monitor these pollutants, called criteria pollutants, and report the findings to the U. S. Environmental Protection Agency (EPA). The criteria pollutants are particulate matter, lead, ozone, nitrogen dioxide, sulfur dioxide, and carbon monoxide. The DNR monitors criteria pollutants to meet federal requirements.

The DNR, also, monitors for other pollutants such as air toxics and mercury. These pollutants do not have federal standards.

Network Overview

The DNR monitors ambient air quality at 39 sites throughout Wisconsin including 35 State and Local Air Monitoring Stations (SLAMS) sites, two tribal sites, four Chemical Speciation Network (CSN) sites, one National Air Toxics Trend Station (NATTS) and five National Atmospheric Deposition Program (NADP) sites and excluding a number of Biowatch sites in Southeastern Wisconsin. Figure 1 and Table 2 shows these 39 sites. In addition to these sites, there are industrial air quality monitors that must conform to EPA standards, and are owned and operated by the specific industrial facilities. Site location is partly dependent upon population density. Consequently, the majority of sites are in the Southeastern part of the state.

Minimum Monitoring Requirements

The EPA establishes the minimum number of monitoring sites required to meet national ambient monitoring objectives. The minimum monitoring requirements are codified in Appendix D of 40 CFR Part 58. Minimum monitoring requirements are specific to each individual pollutant (e.g. ozone, PM_{2.5}) or objective based (e.g. NCore, PAMs). Minimum monitoring requirements typically rely on population and/or air pollution emissions data. Wisconsin currently meets all minimum air monitoring requirements. Appendices A and B provide a detailed discussion of these requirements and any applicable waivers.

Monitoring Objectives

Since it is not possible to monitor everywhere in the state, the concept of spatial scales is used to clarify the

link between monitoring objectives and the physical location of the monitor. When designing an air monitoring network one or more of the following six objectives should be determined:

1. Highest concentrations expected to occur in the area covered by the network
2. Representative concentrations in areas of high population density
3. Impact of specific sources on ambient pollutant concentrations
4. General background concentration levels
5. Extent of regional transport among populated areas and in support of secondary standards
6. Welfare-related impacts in the more rural and remote areas

Site Selection

The selection of air monitoring sites is usually based on at least one of these basic monitoring objectives:

- Determine representative concentrations and exposure in areas of high population density.
- Determine the highest concentrations of pollutants in an area based on topography and/or wind patterns.
- Judge compliance with and/or progress made towards meeting the NAAQS.
- Track pollution trends.
- Determine the highest concentrations of pollutants within the state based on the known atmospheric chemistry of specific pollutants and wind patterns.
- Determine the extent of regional pollutant transport to and from populated areas.
- Determine how much major sources impact ambient pollution levels.
- Validate control strategies designed to prevent or alleviate air pollution.
- Provide a data base for research and evaluation of air pollution effects.
- Determine general background concentration levels.

The exact location of a site is most often dependent on the logistics of the area chosen for monitoring, such as access, security and power availability.

Network Scales

The EPA developed a system which specifies an exclusive area or spatial scale that an air monitor represents. The goal in establishing air monitoring sites is to correctly match the spatial scale that is most appropriate for the monitoring objective of the site (Table 1). The representative measurement scales are:

- **Micro Scale (10-100 m)** – Defines the concentrations in air volumes associated with area dimensions ranging from several meters up to about 100 meters. Measurements on the micro scale typically include concentrations in street canyons, intersections and areas next to major emission sources.
- **Middle Scale (100-1,000 m)** – Defines the concentration typical of areas up to several city blocks in size with dimensions ranging from about 100 to 1,000 meters.
- **Neighborhood Scale (1-4 km)** – Defines concentrations within some extended area of the city that has relatively uniform land use with dimensions in the one to four kilometers range. Generally, these stations represent areas with moderate to high population densities.
- **Urban Scale (4-50 km)** – Defines the overall, citywide conditions with dimensions on the order of four to 50 kilometers. This scale represents conditions over an entire metropolitan area and is useful in assessing city-wide trends in air quality.
- **Regional Scale/ Background (50-1,000 km)** – Usually a rural area of reasonably homogeneous geography and extends from tens to hundreds of kilometers.

Table 1: Network Scales

Monitoring	Appropriate Siting Scales
Highest Concentration	Micro, Middle, Neighborhood (sometimes Urban)
Population Exposure	Neighborhood, Urban
Source Impact	Micro, Middle, Neighborhood
General/Background	Urban, Regional (sometimes Neighborhood)
Regional Transport	Urban, Regional

Regional Network Assessment

In addition to the air monitoring network plan, the EPA requires states to complete a network assessment every five years. Under the direction of the Lake Michigan Air Directors Consortium (LADCO), Wisconsin collaborated with other states in our region for the first network assessment which was completed in 2010, http://www.ladco.org/reports/general/Regional_Network_Assessment/index.html. The network assessment provides a detailed evaluation of the regional air monitoring network. It contains a network history, a re-evaluation of the types of pollutants monitored and an evaluation of the network's objectives and costs. Also, it includes spatial analysis of ambient air monitoring data and a reconsideration of monitor placement based on changes in land use and population.

For the 2015 Network Assessment, DNR again collaborated with other EPA Region 5 states. The results of the 2015 Regional Network Assessment can be found on LADCO's website at http://www.ladco.org/reports/general/Regional_Network_Assessment/RNA15.html.

Recommendations of the 2015 Network Assessment:

- Criteria pollutant monitoring networks are adequate to meet EPA's minimum monitoring criteria.
- Monitoring equipment is aging and will require replacement in the coming years.
- Disinvestment or relocation of existing PM_{2.5} and ozone monitoring sites is very difficult due to stringent EPA criteria for shutdown.
- Field studies would be helpful to identify the conditions that control the extent of lake breeze development and improve our ability to model its behavior and impact on ozone concentrations.

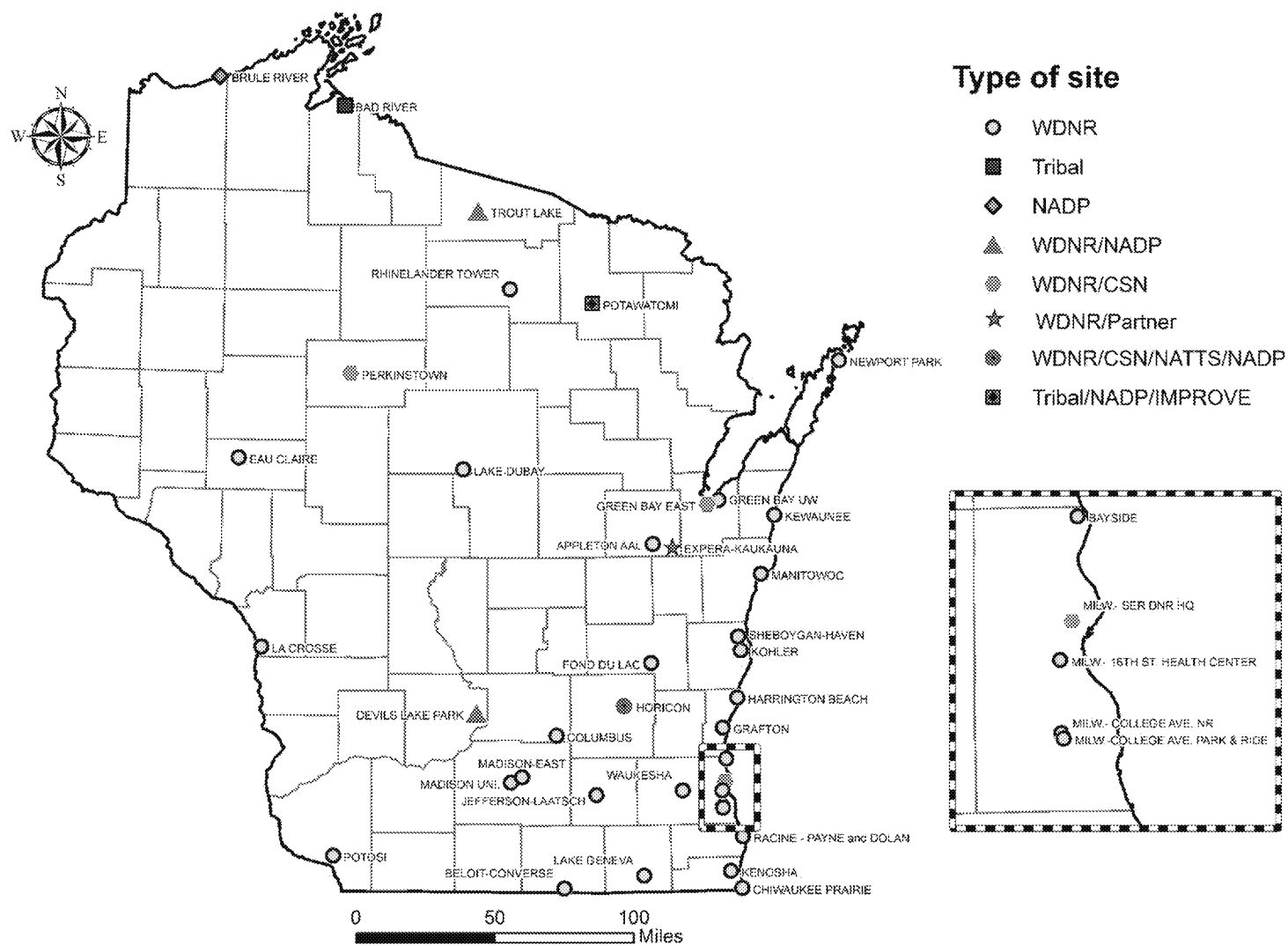
Table 2: Site Information – Wisconsin Sites Active in 2018

Site name	AQS Site ID	County	Address	City	LAT	LONG	Year Established
Appleton AAL	55-087-0009	Outagamie	4432 NORTH MEADE STREET AAL BUILDING	APPLETON	44.3074	-88.3951	1995
Bad River Tribal School – Odanah**	55-003-0010	Ashland	BAD RIVER TRIBAL SCHOOL	ODANAH	46.6023	-90.6562	2002
Bayside	55-079-0085	Milwaukee	601 E. ELLSWORTH LN.	BAYSIDE	43.1811	-87.9006	1984
Beloit-Converse	55-105-0030	Rock	1501 RITSHER ST.	BELOIT	42.5183	-89.0635	2013
Brule River*	NA	Douglas	NA	DOUGLAS	46.7466	-91.6055	1996
Chiwaukee Prairie Stateline	55-059-0019	Kenosha	11838 FIRST COURT	PLEASANT PRAIRIE	42.5047	-87.8093	1987
Columbus	55-021-0015	Columbia	WENDT ROAD	COLUMBUS	43.3156	-89.1089	1988
Devils Lake Park*	55-111-0007	Sauk	EAST 12886 TOWER ROAD	NA	43.4351	-89.6797	1995
Eau Claire - DOT Sign Shop	55-035-0014	Eau Claire	5509 HIGHWAY 53 SOUTH	EAU CLAIRE	44.7610	-91.4130	2011
Expera - Kaukauna	55-087-0015	Outagamie	601 PLANK RD.	KAUKAUNA	44.2893	-88.25219	2017
Fond Du Lac	55-039-0006	Fond Du Lac	N3996 KELLY ROAD	FOND DU LAC	43.6874	-88.4220	1994
Grafton	55-089-0008	Ozaukee	N. PORT WASH.RD., E SIDE OF HWY 32 & I43	GRAFTON	43.3430	-87.9200	1991
Green Bay East High	55-009-0005	Brown	1415 EAST WALNUT	GREEN BAY	44.5073	-87.9934	1971
Green Bay UW	55-009-0026	Brown	UW GREEN BAY, HIGHWAYS 54 & 57	GREEN BAY	44.5300	-87.9089	1994
Harrington Beach Park	55-089-0009	Ozaukee	531 HWY D	BELGIUM	43.4980	-87.8100	1994
Horicon Wildlife Area*	55-027-0001	Dodge	1210 N. PALMATORY ST	HORICON	43.4661	-88.6211	1982
Jefferson-Laatsch	55-055-0009	Jefferson	N4440 LAATSCH LANE	JEFFERSON	43.0034	-88.8283	2013
Kenosha-Water Tower	55-059-0025	Kenosha	4504 64TH AVE.	KENOSHA	42.5960	-87.8860	2013
Kewaunee	55-061-0002	Kewaunee	ROUTE 1, HIGHWAY 42	KEWAUNEE	44.4431	-87.5052	1994
Kohler	55-117-0008	Sheboygan	444 HIGHLAND DR	KOHLER	43.7440	-87.7763	2009
La Crosse - DOT Building	55-063-0012	La Crosse	3550 MORMON COULEE RD	LA CROSSE	43.7775	-91.2269	2005
Lake DuBay	55-073-0012	Marathon	1780 BERGEN ROAD	BERGEN	44.7072	-89.7697	1991
Lake Geneva	55-127-0005	Walworth	2420 ELGIN CLUB RD	LAKE GENEVA	42.5800	-88.4992	1987

Site name	AQS Site	County	Address	City	LAT	LONG	Year Established
Madison University Ave Well #6	55-025-0047	Dane	2757 UNIVERSITY AVENUE	MADISON	43.0733	-89.4358	1992
Madison-East	55-025-0041	Dane	2302 HOARD ST.	MADISON	43.1008	-89.3572	1999
Manitowoc WdInd Dunes	55-071-0007	Manitowoc	2315 GOODWIN ROAD	TWO RIVERS	44.1386	-87.6161	1994
Milwaukee - College Ave. NR	55-079-0056	Milwaukee	1550 W. COLLEGE AVE.	MILWAUKEE	42.9326	-87.9343	2013
Milwaukee - College Ave. Park & Ride	55-079-0058	Milwaukee	1550 W. COLLEGE AVE.	MILWAUKEE	42.9306	-87.9321	2009
Milwaukee Fire Dept. HQ	55-079-0099	Milwaukee	711 W. WELLS ST.	MILWAUKEE	43.0410	-87.9250	1970 Shutdown in March 2017.
Milwaukee SER DNR Hdqrs	55-079-0026	Milwaukee	2300 N. MARTIN LUTHER KING JR. DR.	MILWAUKEE	43.0610	-87.9135	1999
Milwaukee Sixteenth St. Health	55-079-0010	Milwaukee	1337 S. 16TH ST.	MILWAUKEE	43.0167	-87.9333	1997
Newport Park	55-029-0004	Door	475 CTH NP	NA	45.2370	-86.9930	1989
Perkinstown*	55-119-8001	Taylor	W10746 CTY RD. M	TAYLOR	45.2066	-90.5972	1988
Potawatomi**	55-041-0007	Forest	FIRE TOWER ROAD	NA	45.5650	-88.8086	2002
Potosi	55-043-0009	Grant	128 HWY 61, POTOSI TOWNSHIP	POTOSI	42.6930	-90.6980	1999
Racine – Payne & Dolan	55-101-0020	Racine	4227 Charles St.	RACINE	42.7738	-87.7961	2015
Rhineland Tower	55-085-0996	Oneida	434 HIGH STREET	RHINELANDER	45.6451	-89.4185	1981
Sheboygan-Haven	55-117-0009	Sheboygan	N7563 Hwy 42	SHEBOYGAN	43.8152	-87.7919	2014
Trout Lake*	55-125-0001	Vilas	TROUT LAKE NURSERY 10810 COUNTY HWY M	BOULDER JUNCTION	46.0520	-89.6530	1973
Waukesha-Cleveland Ave.	55-133-0027	Waukesha	1310 CLEVELAND AVE.	WAUKESHA	43.0203	-88.2150	1989

*NADP Site ID **Tribal Site

Figure 1: 2018 Air Monitoring Sites in Wisconsin



Quality Assurance/Quality Control (QA/QC) Program

The purpose of the QA/QC program is to assure the quality of data obtained from the DNR air monitoring sites. The DNR meets or exceeds the QA requirements defined in 40 CFR 58 and all applicable appendices.

The QA/QC program includes but is not limited to the following activities:

- Instrument performance audits
- Monitor siting evaluations
- Zero, precision and span checks
- Bias determinations
- Flow rate audits
- Leak checks
- Data validation

For independent quality assurance activities, the DNR participates in EPA's National Performance Audit Program (NPAP) which includes Through the Probe (TTP) audits, the PM_{2.5} Performance Evaluation Program (PM_{2.5}-PEP) program and the Pb Performance Evaluation Program (Pb-PEP) for criteria pollutant monitoring. Additional inter-laboratory comparisons of performance test and exchange samples are performed periodically for air toxics monitoring.

As the Primary Quality Assurance Organization (PQAO) for ambient air monitoring activities in Wisconsin, the DNR operates under an EPA approved Quality Management Plan (QMP) and utilizes Quality Assurance Project Plans (QAPPs) for each statewide monitoring network. The primary purpose of the QAPPs is to provide an overview of the project, describe the need for the measurements, and define QA/QC activities to be applied to the project. All other ambient air monitoring initiatives including state, tribal, and industrial projects must have a DNR approved monitoring plan for each specific project.

As part of instrument performance audits, each monitoring site is assessed to ensure that all applicable EPA siting requirements are fully met. This also includes a safety inspection to assure a safe work environment for site operators and staff and that monitoring stations are being properly maintained.

Data Processing and Reporting

With the exception of the NADP, fine particle speciation and BioWatch data; ambient air quality data are stored in a centralized server located at the Wisconsin Department of Administration. Continuous pollutant monitoring data are retrieved hourly and posted to the DNR Air Quality website (<https://airquality.wi.gov/StateMapping.aspx>) and sent to EPA's AirNow web site (https://airnow.gov/index.cfm?action=airnow.local_state&stateid=51&tab=1).

Particulate data collected over 24 hours (filter-based method) are made available in the EPA's national data storage system known as Air Quality System (AQS) after processing. After data have been evaluated for all quality assurance checks, data are transmitted to AQS.

The federal contract laboratory for fine particle speciation is responsible for reporting the results directly to EPA. However, the DNR is responsible reviewing the data.

Types of Networks

Air monitoring networks are designed to satisfy a variety of purposes including monitoring compliance with the NAAQS, public reporting of air quality, assessing population exposure and risk from air toxics, determining pollution trends, monitoring specific emissions sources, investigating background conditions and evaluating computer models. Below are descriptions of the existing monitoring networks in Wisconsin.

State and Local Air Monitoring Sites (SLAMS)

SLAMS consist of a network of monitoring sites whose size and distribution is largely determined by the monitoring requirements for National Ambient Air Quality Standards (NAAQS) comparison and the needs of monitoring organizations to meet their respective tribal/state implementation plan (TIP/SIP) requirements. Most Wisconsin monitoring sites are part of the SLAMS network. Sites in the SLAMS network may also belong to monitoring networks described below.

Special Purpose Monitor (SPM) Sites

SPM sites have a monitor designated as special purpose in the state's monitoring network plan and in the Air Quality System (AQS). SPMs provide for special studies needed by the monitoring organizations to support TIPs/SIPs and other air program activities. These monitors are not counted towards the monitoring organizations minimum requirements established in CFR for monitoring certain pollutants. The Wisconsin network has two ozone SPMs located at Kenosha – Water Tower site (55-059-0025) in Kenosha county and Sheboygan-Haven (55-117-0009) in Sheboygan county.

Chemical Speciation Network (CSN)

The CSN network is an EPA effort to gather data on the chemical composition of PM_{2.5} and to provide a long-term record of the concentration levels of selected ions, metals, carbon species, and organic compounds found in PM_{2.5}. The EPA established this network consisting of approximately 300 monitoring sites. CSN data can be useful for assessing trends and developing mitigation strategies to reduce emissions and ambient concentrations. Some of these CSN sites which are part of the Speciation Trends Network (STN) are used to determine trends in concentration levels of selected ions, metals, carbon species, and organic compounds in PM_{2.5}.

Currently, there are four CSN sites in Wisconsin: Green Bay East High, Horicon Wildlife Area, Milwaukee SER DNR Hdqrs and Perkinstown. Figure 1 shows the locations of these sites.

Enhanced Monitoring and Photochemical Assessment Monitoring Stations (PAMS)

Section 182(c)(1) of the 1990 CAA requires the enhanced monitoring of ozone, oxides of nitrogen (NO_x), and volatile organic compounds (VOC). The chief objective of the enhanced ozone monitoring revisions is to provide an air quality database that assists air pollution control agencies in evaluating, tracking the progress of and refining control strategies for attaining the ozone NAAQS. The data helps ensure the implementation of the most effective regulatory controls. In 1993, revisions to 40 CFR 58 required states to establish Photochemical Assessment Monitoring Stations (PAMS) as part of their SIP monitoring networks in ozone nonattainment areas classified as serious, severe or extreme.

On October 26, 2015, EPA published its final 2015 Ozone NAAQS rule which took effect on December 28, 2015. This rule included new PAMS requirements that removed the requirement for a PAMS site in Milwaukee. Consequently, the Milwaukee SER DNR Hdqrs PAMS site shut down in 2017. Section 182(c)(1) of the CAA, requires the enhanced monitoring of ozone, oxides of nitrogen (NO_x), and volatile organic

compounds (VOC). Enhanced ozone monitoring will continue at the Sheboygan Haven (55-117-0009), Kenosha Water Tower (55-059-0025), Milwaukee SER DNR Hdqrs (55-079-0026) and Manitowoc WdInd Dunes sites (55-071-0007). Additionally, monitoring of VOC will continue at the Milwaukee Health Center (55-079-0010) site for the time period covered in this plan. The Enhanced Ozone Monitoring plan can be found in Appendix E.

National Air Toxics Trends Stations (NATTS)

There are currently 187 hazardous air pollutants (HAPs) or Air Toxics (AT) regulated under the CAA. These pollutants have been associated with a wide variety of adverse health and ecosystem effects. In 1999, EPA finalized the Urban Air Toxics Strategy (UATS). The UATS states that emissions data are needed to quantify the sources of air toxics impacts and aid in the development of control strategies, while ambient monitoring data are needed to understand the behavior and concentration of air toxics in the atmosphere after they are emitted. Part of this strategy included the development of the National Air Toxics Trends Stations (NATTS). The NATTS programs measures core air toxics pollutants including VOCs, carbonyl, metals, hexavalent chromium, and PAHs. Specific data quality objectives are set for monitoring sites in the NATTS network. At NATTS sites, EPA has established a goal to be able to detect a 15% concentration change between two 3-year annual mean concentrations within acceptable error. The NATTS data are also used for:

- Tracking trends in ambient levels to evaluate progress toward emission and risk reduction goals
- Evaluating public exposure & environmental impacts in the vicinity of monitors
- Providing quality assured data for risk characterization
- Assessing the effectiveness of specific emission reduction activities
- Evaluating and subsequently improving air toxics emission inventories and model performance

Nationally the NATTS program is made up of 27 monitoring sites: 20 representing urban communities and 7 representing rural communities. The DNR operates one rural NATTS site at the Horicon Wildlife Area super site (55-027-0001) in Dodge County.

National Core Monitoring Network (NCore)

The NCore multi-pollutant sites are part of an overall strategy to integrate multiple monitoring networks and measurements. Each state (i.e. the fifty states, District of Columbia, Puerto Rico, and the Virgin Islands) and some local government entities are required to operate at least one NCore site. Monitors at NCore multi-pollutant sites measure particles (PM_{2.5}, speciated PM_{2.5}, PM_{10-2.5}, speciated PM_{10-2.5}), O₃, SO₂, CO, nitrogen oxides (NO/ NO₂/NO_y), and basic meteorology. In addition, a number of rural NCore sites may be selected to measure lead (Pb).

The objective is to locate sites in broadly representative urban (about 63 sites) and rural (about 17 sites) locations throughout the country to help characterize regional and urban patterns of air pollution. In many cases, monitoring organizations collocate these sites with Speciation Trends Network (STN) sites measuring speciated PM_{2.5} components, PAMS sites already measuring O₃ precursors, and/or NATTS sites measuring air toxics. By combining these monitoring programs at a single location, EPA and its partners maximize the multi-pollutant information available. This greatly enhances the foundation for future health studies, NAAQS revisions, validation of air quality models, assessment of emission reduction programs, and studies of ecosystem impacts of air pollution.

Wisconsin's NCore site (Horicon Wildlife Area) is located in Dodge County representing a rural area. High sensitivity nitrogen oxides, carbon monoxide and sulfur dioxide began operating at that site in 2005 and 2006.

National Atmospheric Deposition Program (NADP)

This National Atmospheric Deposition Program (NADP) is a cooperative effort between federal, state, tribal and local governmental agencies, educational institutions, private companies and non-governmental agencies that measures atmospheric pollutants (i.e. acids, nutrients, and base cations) deposited to land and surface water in wet and dry form (<http://nadp.sws.uiuc.edu/>). NADP consists of five networks: National Trends Network, Mercury Deposition Network, Atmospheric Integrated Monitoring Network, Atmospheric Mercury Network and Ammonia Monitoring Network. Data are made available on the NADP website: <http://nadp.sws.uiuc.edu/NADP/>. Four of these networks operate in Wisconsin.

- **National Trends Network (NTN):** This national network measures precipitation chemistry. The DNR operates three NTN sites throughout the state at Trout Lake, Devils Lake Park and Brule River. Additionally, one site is operated by the U.S. Forest Service at Spooner, one by the EPA at Perkinstown and one by the Forest County Potawatomi Community at Potawatomi. Site operators follow standard procedures to ensure NTN data comparability and representativeness. They collect and send samples weekly to a predetermined Central Analytical Laboratory (CAL). The CAL reviews field and laboratory data and delivers all data and information to the NADP office, which applies a final set of checks and resolves remaining discrepancies.
- **Mercury Deposition Monitoring Network (MDN):** This national network measures atmospheric mercury deposition to land and surface water in the form of precipitation. All MDN sites follow standard procedures and have uniform precipitation chemistry collectors and gauges. Four MDN sites are located in Wisconsin. Three sites are operated by the DNR at Trout Lake, Devils Lake Park, and Brule River. One site is operated by the Forest County Potawatomi Community. Site operators collect and send samples to the designated laboratory which is the Mercury Analytical Laboratory (HAL). The HAL delivers all data and information to the NADP Program Office for final checks and resolution of remaining discrepancies.
- **Atmospheric Mercury Network (AMNet):** This network measures atmospheric mercury fractions which contribute to dry and total mercury deposition. There is an AMNet site located at Horicon operated by the DNR which has been active since January of 2010.
- **Ammonia Monitoring Network (AMoN):** This network measures ammonia gas concentrations across the United States. There are AMoN sites located at Horicon and Perkinstown. The Horicon site is operated by the DNR and has been active since January of 2007. The Perkinstown site is operated by EPA.

Near-Road Air Quality Monitoring

In 2010, the EPA introduced a new air monitoring network to measure air pollution levels near heavily trafficked roadways. Near-road air monitoring sites are required to be located within 50 meters of the busiest roadways across the country. Near-road monitoring sites are required to measure hourly levels of nitrogen dioxide (NO₂), carbon monoxide (CO) and fine particles (PM_{2.5}).

In Wisconsin, DNR installed one near-road monitoring site as required. It began operating along the Chicago/Kenosha/ Milwaukee corridor near I-94 in Milwaukee on January 1, 2014. Various parameters are being measured at the near-road site (Table 3).

Table 3: Near-Road Parameters

Site Name	AQS Site ID	City	CO	NO ₂	PM _{2.5} FEM	Other Parameters
Milwaukee - College Ave. NR	55-079-0056	Milwaukee	x	x	x	Meteorological

The DNR near-road air quality monitoring is described in more detail on the DNR near-road website at <http://dnr.wi.gov/topic/AirQuality/Monitor.html>.

Interagency Monitoring of Protected Visual Environments (IMPROVE) Program

The Interagency Monitoring of Protected Visual Environments (IMPROVE) program created a monitoring network to determine the current visibility conditions, track changes in visibility and find the causal mechanism for the visibility deterioration in the National Parks and Wilderness Areas. The IMPROVE steering committee is composed of representatives from EPA, the National Park Service, USDA Forest Service, Fish and Wildlife Service, the Bureau of Land Management, State and Territorial Air Pollution Program Administrators, Western States Air Resources Cooperative, and Northeast States for Coordinated Air Use Management. Forest County Potawatomi Community established monitors and became part of the IMPROVE program on January 1, 2018.

Industrial

In Wisconsin, air pollution control permits are required to legally operate certain industrial facilities, to begin construction on new facilities or to modify certain facilities. Air pollution control permits contain state and federal requirements to minimize the adverse impacts of air emissions from these facilities. Some federal programs specify performance standards for certain types of facilities or processes within a facility. Others address the impact of newly constructed facilities or modifications to existing facilities on ambient air quality. Facilities that are required by state regulations to monitor ambient air quality near their facility receive assistance from the DNR through monitoring plan review, siting evaluations, instrument performance audits and data review. These facilities are responsible operating sampling equipment and additional QA/QC activities. Table 4 lists the industrial monitoring sites. Facilities monitoring for SO₂ under the 2015 Data Requirements Rule operate similarly with the DNR providing additional assistance with data reporting to AQS and annual data certification. Currently, there is a single industrial source monitoring for SO₂ in Kaukauna. This SO₂ monitoring site is included in the DNR SO₂ network described later in this plan and in Appendix A.

BioWatch

BioWatch, operated through the Department of Homeland Security, is an early warning system designed to detect the release of biological agents in the air through a comprehensive protocol of monitoring and laboratory analysis. The program was designed to demonstrate the effectiveness of new technology in protecting public health. Given the nature of the program, few details are available publicly.

The goals of BioWatch are to:

- Provide early warning of a biological attack by expeditiously identifying the bio-agent, thereby, minimizing casualties in the affected area.
- Assist in establishing forensic evidence on the source, nature and extent of biological attack to aid law enforcement agents in identifying the perpetrators.

- Determine a preliminary spatial distribution of biological contamination including what populations may have been exposed.

Table 4: Industrial Monitoring Sites in Wisconsin*

Facility	AQS Site ID	County	Pollutants
Hi-Crush – Blair	55-121-1004	Trempealeau	PM ₁₀
Hi-Crush – Whitehall	55-121-1002	Trempealeau	PM ₁₀
MetalTek International Wisconsin Centrifugal	55-133-0039	Waukesha	TSP
Northern White Sand LLC	55-005-1002	Barron	PM ₁₀
Piranha Proppant, LLC	55-005-1004	Barron	PM ₁₀
Sand Products – Blair	55-121-1003	Trempealeau	PM ₁₀
Smart Sands – Hixton	55-053-1002	Jefferson	PM ₁₀
Smart Sands – Oakdale	55-081-1001	Monroe	PM ₁₀
Superior Silica Sands – Arland Plant	55-005-1006	Barron	PM ₁₀
Superior Silica Sand - Clinton Plant	55-005-1003	Barron	PM ₁₀
Superior Silica Sands - New Auburn	55-005-1001	Barron	PM ₁₀
Superior Silica Sands – Thompson Hills	55-005-1005	Barron	PM ₁₀
Unimin - Basin Site #3	55-081-1005	Monroe	PM ₁₀
Unimin - Curran Site #1	55-081-1003	Monroe	PM ₁₀
Unimin - Rouse Site #2	55-081-1004	Monroe	PM ₁₀
Wisconsin Proppants – Alma #1	55-053-1004	Jackson	PM ₁₀
Wisconsin Proppants – Alma #2	55-019-1001	Clark	PM ₁₀
Wisconsin Proppants - Hixton	55-053-1003	Jefferson	PM ₁₀

* Industrial monitoring sites may start up or shut down in 2018-2019 as warranted by permits issued/updated and variances granted.

Parameter Networks

The DNR monitors different types of measurable properties called parameters. The group of sites where a parameter is monitored is referred to as a parameter network. Generally, parameters are pollutants such as fine particles or ozone. However, parameters, also, include non-concentration data such as wind direction, wind speed and temperature. In addition to the parameter networks prescribed by EPA, the DNR operates sites within other networks such as the Mercury Deposition Network (MDN) and National Trends Network (NTN).

The DNR monitors the six criteria pollutants established by the 1970 CAA to show compliance with the NAAQS. The criteria pollutants are particles (PM_{2.5} and PM₁₀), lead (Pb), ozone (O₃), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), and carbon monoxide (CO). The DNR works with adjacent states to meet the criteria pollutant requirements. These cooperative efforts are described in the Memorandums of Agreement (MOAs) found in Appendix C.

Other types of particle pollution are also collected in Wisconsin. Chemical speciation of PM_{2.5} is currently monitored at four sites in Wisconsin through the CSN. Speciation data are used for trends analysis and to better understand the sources of fine particles.

In addition, DNR monitors pollutants that pose a potential risk to human health and the environment, but are not regulated by standards including air toxics, acid rain, mercury (Hg) and ammonia. Air toxics include volatile organic compounds (VOCs), carbonyls, polycyclic aromatic hydrocarbons (PAHs) and metals. Acid rain, mercury and ammonia are monitored through the NADP network across Wisconsin.

Temperature, wind speed, wind direction, barometric pressure, relative humidity and solar radiation strongly influence the concentrations and transport of pollutants. Meteorological data are collected at 18 sites including two tribal sites. Meteorological data from other sources (e.g. airports) near air monitoring stations can also be used to help interpret air quality monitoring data.

Generally, parameters are monitored continuously or as discrete data. Continuous data gives readings on a real-time basis in short increments such as every one or five minutes or every hour. Discrete samples are usually 24-hour averages; samples are collected at sites and then transported to the Wisconsin State Lab of Hygiene (WSLH) for further analysis or submitted to national laboratories (CSN, NADP). Discrete samples are collected midnight to midnight at various sampling frequencies ranging from every three days to every 12 days. Continuous data are collected and analyzed at the site.

Table 5 lists all of the air quality monitoring sites in Wisconsin and the parameters monitored. Table 6 lists the types of parameters monitored by the DNR along with the methods and equipment used. Appendix D provides detailed individual site descriptions.

Table 5: 2018 Site Parameters

Site Name	AQS Site ID	County	O ₃	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Meteorological	Pb-TSP	Metals (PM ₁₀)	NO _y	PAH	VOC-Carbonyl	Hg	AMNet	AMoN	MDN	NTN	IMPROVE
Appleton AAL	55-087-0009	Outagamie	S	C																	
Bad River Tribal School – Odanah**	55-003-0010	Ashland	Y	F						Y & RF											
Bayside	55-079-0085	Milwaukee	S																		
Beloit-Converse	55-105-0030	Rock	S																		
Brule River*	NA	Douglas																	Y	Y	
Chiwaukee Prairie Stateline	55-059-0019	Kenosha	S	C						Y & RF											
Columbus	55-021-0015	Columbia	S																		
Devils Lake Park*	55-111-0007	Sauk	S	C & Cc	C & Cc	C & Cc				Y									Y	Y	
Eau Claire - DOT Sign Shop	55-035-0014	Eau Claire	S	C						Y											
Expera - Kaukauna	55-087-0015	Outagamie					Y			Y											
Fond Du Lac	55-039-0006	Fond Du Lac	S																		
Grafton	55-089-0008	Ozaukee	S							S & RF											
Green Bay East High	55-009-0005	Brown		C & M			Y														
Green Bay UW	55-009-0026	Brown	S																		
Harrington Beach Park	55-089-0009	Ozaukee	S	C						Y											
Horicon Wildlife Area*	55-027-0001	Dodge	Y	C, F & M	C, F & Fc	C	H S		HS	Y & RF		Y & Yc	HS	Y	Y	Tek (GEM, GOM & PBM), AM	Y	Y			
Jefferson-Laatsch	55-055-0009	Jefferson	S																		
Kenosha-Water Tower	55-059-0025	Kenosha	S							S											
Kewaunee	55-061-0002	Kewaunee	S																		
Kohler	55-117-0008	Sheboygan									Y & Yc										

Site Name	AQS Site ID	County	O ₃	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Meteorological	Pb-TSP	Metals (PM ₁₀)	NO _y	PAH	VOC-Carbonyl	Hg	AMNet	AMoN	MDN	NTN	IMPROVE
La Crosse - DOT Building	55-063-0012	La Crosse	S	C																	
Lake DuBay	55-073-0012	Marathon	S																		
Lake Geneva	55-127-0005	Walworth	S							S											
Madison University Ave Well #6	55-025-0047	Dane		F	F																
Madison-East	55-025-0041	Dane	S	F & C			Y			Y & RF											
Manitowoc WdInd Dunes	55-071-0007	Manitowoc	S					S		S			S								
Milwaukee - College Ave. NR	55-079-0056	Milwaukee		C				Y	HS	Y											
Milwaukee College Ave. Park & Ride	55-079-0058	Milwaukee		C	F & Fc																
Milwaukee SER DNR Hdqrs	55-079-0026	Milwaukee	Y	C, F, Fc & M	C	C	Y	Y		Y			S			Tek (GEM)					
Milwaukee Sixteenth St. Health Center	55-079-0010	Milwaukee	S	C & F	F							Y			Y	Tek (GEM)					
Newport Park	55-029-0004	Door	S							S											
Perkinstown*	55-119-8001	Taylor		C & M																	
Potawatomi**	55-041-0007	Forest	Y	C			Y			Y						Tek (GEM)			Y	Y	Y
Potosi	55-043-0009	Grant		C																	
Racine - Payne and Dolan	55-101-0020	Racine	S																		
Rhinelander Tower	55-085-0996	Oneida					Y			Y											
Sheboygan-Haven	55-117-0009	Sheboygan	S							S											
Trout Lake	55-125-0001	Vilas	S	C															Y	Y	
Waukesha-Cleveland Ave.	55-133-0027	Waukesha	S	C & F	F					Y											

* NADP site ** Tribal monitor

c – Collocated monitor

D – Discontinued

HS – High Sensitivity

P – PAMS

S – Seasonal monitoring

Y – Year round monitoring

C – Continuous

F – Federal Reference Method

M – Fine Particle Speciation – Cation/Anion/Carbon

RF – Precipitation for National Weather Service

Tek – Tekran mercury monitoring

Table 6: Methods and Equipment

Monitoring Parameter	Methods and Equipment	Analyzing Agency
Acid Deposition	Wet-only precipitation collection, Chromatography analysis	NADP
Black Carbon	Optical Absorption - Magee AE33	DNR
Carbonyls	High Performance Liquid Chromatography – DNR Canister-Cartridge	WSLH
CO	Gas Filter Correlation– Teledyne API Model T300U	DNR
Lead	Inductively Coupled Plasma Atomic Emission Spectroscopy – Tisch 5070V Hi-Vol sampler for TSP with glass fiber filters	WSLH
Mercury Deposition	Wet-only precipitation collection, Inductively Coupled Argon Plasma analysis	NADP
Metals	Inductively Coupled Plasma Atomic Emission Spectroscopy – Tisch 6070V Hi-Vol sampler for PM ₁₀ with quartz filters	WSLH
Meteorological Data	Various meteorological sensors	DNR
NO/NO _y trace level	Chemiluminescence – Teledyne API Model T200U	DNR
NO ₂	Chemiluminescence – Teledyne API Models 200E/T200 and Cavity Attenuated Phase Shift Spectroscopy - Teledyne Model T500U	DNR
O ₃	Ultraviolet Absorption – Teledyne API Models 400E/ T400	DNR
PAHs	Gas Chromatography/ Mass Spectrometry Thermo Model PS-1	WSLH
PM ₁₀	Gravimetric – Tisch 6070V Hi-Vol samplers	DNR
PM ₁₀ - FEM	Beta Attenuation – MetOne Instruments BAM-1020	DNR
PM _{10-2.5} - FRM	Beta Attenuation – MetOne Instruments BAM-1020	DNR
PM _{2.5} FEM	Beta Attenuation – MetOne Instruments BAM-1020 FEM	DNR
PM _{2.5} FRM	Gravimetric – Thermo Partisol-Plus Models 2025i PM2.5 Sequential Air Samplers	DNR
PM _{2.5} Speciation - CSN	Gravimetric, GC/MS, Ion Chromatography – MetOne Instruments SASS Speciation Sampler; URG3000N Carbon Samplers	EPA
SO ₂	Pulsed Fluorescence – Teledyne API Models 100E/T100	DNR
SO ₂ trace level	Pulsed Fluorescence – Teledyne API Model T100U	DNR
TSP	Gravimetric – Tisch TE-5070 Hi-Vol samplers	DNR
VOCs	Gas Chromatography and Mass Spectrometry – DNR Canister-Cartridge	DNR

Criteria pollutants

The criteria pollutants as defined in the 1970 CAA are Particulate Matter (PM_{2.5}, PM₁₀), Pb, O₃, NO₂, SO₂ and CO. For each of these pollutants, the EPA has developed national primary and secondary ambient air monitoring concentration standards (NAAQS). Primary standards are set to protect public health, while secondary standards are set to protect the environment and public welfare (i.e. visibility, crops, animals, vegetation, and buildings).

The CAA requires the EPA to review the scientific basis of these standards every five years to ensure they are protective of public health and the environment. Table 7, found on the EPA website at <https://www.epa.gov/criteria-air-pollutants/naaqs-table>, describes the NAAQS standards (as of April 2018).

Table 7: National Ambient Air Quality Standards (NAAQS)

Pollutant [final rule cite]		Primary/ Secondary	Averaging Time	Level	Form
<u>Carbon Monoxide</u> [76 FR 54294, Aug 31, 2011]		primary	8-hour	9 ppm	Not to be exceeded more than once per year
			1-hour	35 ppm	
<u>Lead</u> [73 FR 66964, Nov 12, 2008]		primary and secondary	Rolling 3 month average	0.15 µg/m ³ ⁽¹⁾	Not to be exceeded
<u>Nitrogen Dioxide</u> [75 FR 6474, Feb 9, 2010] [61 FR 52852, Oct 8, 1996]		primary	1-hour	100 ppb	98th percentile, averaged over 3 year
		primary and secondary	Annual	53 ppb ⁽²⁾	Annual Mean
<u>Ozone</u> [80 FR 65292, Oct 26, 2015]		primary and secondary	8-hour	0.070 ppm ⁽³⁾	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
<u>Particle Pollution</u> [78 FR 3086, Jan 15, 2013]	PM _{2.5}	primary	Annual	12 µg/m ³	annual mean, averaged over 3 years
		secondary	Annual	15 µg/m ³	annual mean, averaged over 3 years
		primary and secondary	24-hour	35 µg/m ³	98th percentile, averaged over 3 years
	PM ₁₀	primary and secondary	24-hour	150 µg/m ³	Not to be exceeded more than once per year on average over 3 years
<u>Sulfur Dioxide</u> [75 FR 35520, Jun 22, 2010] [38 FR 25678, Sept 14, 1973]		primary	1-hour	75 ppb ⁽⁴⁾	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m³ as a calendar quarter average) also remain in effect.

(2) The level of the annual NO₂ standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.

(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O₃ standards additionally remain in effect in some areas. Revocation of the previous (2008) O₃ standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.

(4) The previous SO₂ standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO₂ standards or is not meeting the requirements of a SIP call under the previous SO₂ standards (40 CFR 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

Particulate Matter

Particulate matter is not a single pollutant but rather a mixture of solid particles and liquid droplets distributed among numerous gases that interact with solid and liquid phases. The DNR monitors four different particle fractions: fine particulate matter (PM_{2.5}), coarse particulate matter (PM_{10-2.5}) which has an aerodynamic diameter ranging from 2.5 to 10 microns, PM₁₀, and total suspended particulate matter (TSP) which includes the total mass of particles found in a sample of ambient air. PM_{2.5} and PM₁₀ are regulated by the NAAQS. TSP is measured due to the lead analysis method used at the Kohler site in Sheboygan County.

On January 15, 2013, EPA finalized the health-based NAAQS for particle pollution. The annual NAAQS for fine particles (PM_{2.5}) was lowered from 15 micrograms per cubic meter to 12 micrograms per cubic meter. PM_{2.5} can be inhaled deeply into the lungs. There are currently no air quality standards for PM_{10-2.5}.

Fine Particulate Matter (PM_{2.5}) Networks

There are currently 20 PM_{2.5} sites in Wisconsin including two tribal sites (Figure 2). Three types of PM_{2.5} monitors operate in Wisconsin: Federal Reference Method (FRM), Federal Equivalent Method (FEM) and monitors in the Chemical Speciation Network (CSN). Monitors classified as FRM or FEM are regulatory monitors and can be used to demonstrate compliance with the PM_{2.5} NAAQS. Monitors in the CSN network are not eligible for regulatory comparisons.

The FRM monitors collect a 24-hour mass sample of PM_{2.5} on Teflon filters. FRM sites in Wisconsin sample between one in every three days to one in every twelve days. Table 8 summarizes the current sampling frequencies for the FRM monitors. PM_{2.5} data collected using this method can be compared to the NAAQS to demonstrate compliance.

The FEM PM_{2.5} monitors are Met One Instruments BAM-1020 continuous monitors that collect and report hourly PM_{2.5} concentrations. All BAM monitors operating in Wisconsin are designated as FEM and can be used to demonstrate compliance with the PM_{2.5} NAAQS. Hourly PM_{2.5} data are also used to calculate the AQI and develop AQI forecasts for Wisconsin. Continuous data are reported to the DNR's Air Quality website (<https://airquality.wi.gov/StateMapping.aspx>) and the EPA's AIRNow website (<http://airnow.gov/>) as well as the Air Quality System (AQS).

PM_{2.5} FRM / FEM Network

The PM_{2.5} network includes FRM and/or FEM monitors at 20 sites. Currently the DNR operates FRM monitors at seven sites including one tribal sites and FEM continuous monitors at 18 sites including one tribal site (Figure 2). All of the FEM continuous monitors changed from non-FEM monitors at the end of 2016. In collaboration with the EPA, by April of 2018, all PM_{2.5} sites have primary FEMs except (i.e. Bad River Tribal School – Odanah, Madison University Ave. Well #6 and Milwaukee SER).

If a PM_{2.5} FRM or FEM monitoring site were lost due to circumstances beyond the DNR's control, a replacement site would be established if the lost site exceeded the NAAQS or if it is the "design value site" for a particular metropolitan statistical area (MSA). In this case, all possible efforts would be made to find a new site that is physically close to the lost site and has a similar scale and monitoring objective. However, if the "design value site" for that MSA is still operational, the DNR would not establish a replacement site because the "design value site" would be used to determine compliance with the PM_{2.5} NAAQS.

The PM_{2.5} FEM continuous data provides two key types of information that are not available from the FRM network. Continuous data capture days that might be missed in the FRM sampling schedule. Daily monitoring also allows for temporal comparisons between sites on an ongoing basis, providing better comparisons. In addition, continuous PM_{2.5} monitoring provides hourly data that assists in understanding how concentrations vary throughout the day.

PM_{2.5} is a regional pollutant. Therefore, concentrations tend to rise and fall in unison across the state. Figure 3 shows January 2018 daily average PM_{2.5} concentrations from continuous monitors across Wisconsin supporting PM_{2.5} regional nature.

A monitoring site meets the annual PM_{2.5} NAAQS if the three-year average of the annual average PM_{2.5} concentration is less than or equal to 12 µg/m³. Figure 4 shows the average of the 2015 through 2017 annual average PM_{2.5} concentrations at Wisconsin sites and compares them to the standard. Wisconsin averages ranged from 4.1 µg/m³ in Bad River to 8.3 µg/m³ in Milwaukee and Waukesha. Therefore, all sites were below the annual standard.

A site meets the 24-hour NAAQS if the 98th percentile of the 24-hour PM_{2.5} concentrations in a year, averaged

over three years, is less than or equal to $35 \mu\text{g}/\text{m}^3$. Figure 5 shows the average of 2015 through 2017, 98th percentile of the daily $\text{PM}_{2.5}$ averages at Wisconsin sites and compares them to the standard. Wisconsin averages ranged from $12 \mu\text{g}/\text{m}^3$ in Bad River to $22 \mu\text{g}/\text{m}^3$ in Milwaukee. Therefore, all sites were below the 24-hour standard.

$\text{PM}_{2.5}$ Speciation Network

As part of the effort to monitor particulate matter, EPA monitors and gathers data on the chemical makeup of particles. These monitors are placed at various SLAMS across the nation. Some of these CSN sites, the Speciation Trends Network (STN), are used to determine trends in concentration levels of selected ions, metals, carbon species, and organic compounds in $\text{PM}_{2.5}$. Currently, there are four speciation sites in Wisconsin: Green Bay-East, Horicon, Milwaukee-SER and Perkinstown. These operate on a one in three or one in six day schedule. The Forest County Potawatomi Community began IMPROVE monitoring began on January 1, 2018.

Figure 2: 2018 PM_{2.5} Monitoring Sites in Wisconsin

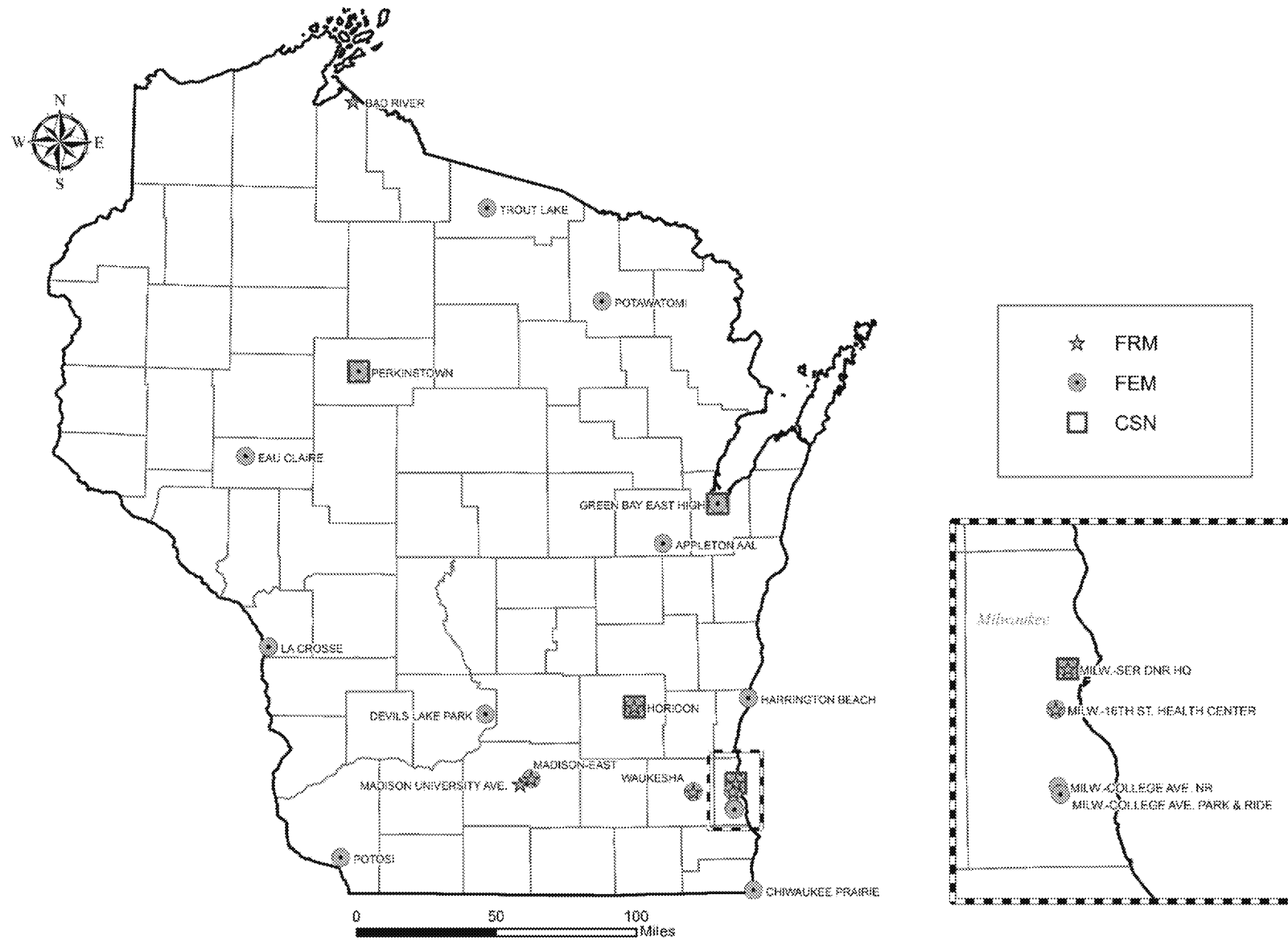


Table 8: FRM Monitors Sampling Frequencies¹

Monitoring Site	AQS Site ID	Sampling Frequency
Bad River Tribal School – Odanah ²	55-003-0010	1 in 6
Horicon Wildlife Area	55-027-0001	1 in 6
Madison East	55-025-0041	1 in 6
Madison University Ave Well #6	55-025-0047	1 in 6
Milwaukee SER DNR Hdqrs ³	55-079-0026	1 in 6 and 1 in 6
Milwaukee Sixteenth St. Health Center	55-079-0010	1 in 3
Waukesha-Cleveland Ave.	55-133-0027	1 in 6

¹ Sampling frequencies may change in 2019 depending on 2017 data.

² Tribal monitor

³ Collocated monitors

Figure 3: January 2018 Daily PM_{2.5} Average Concentrations at Continuous Sites (µg/m³)

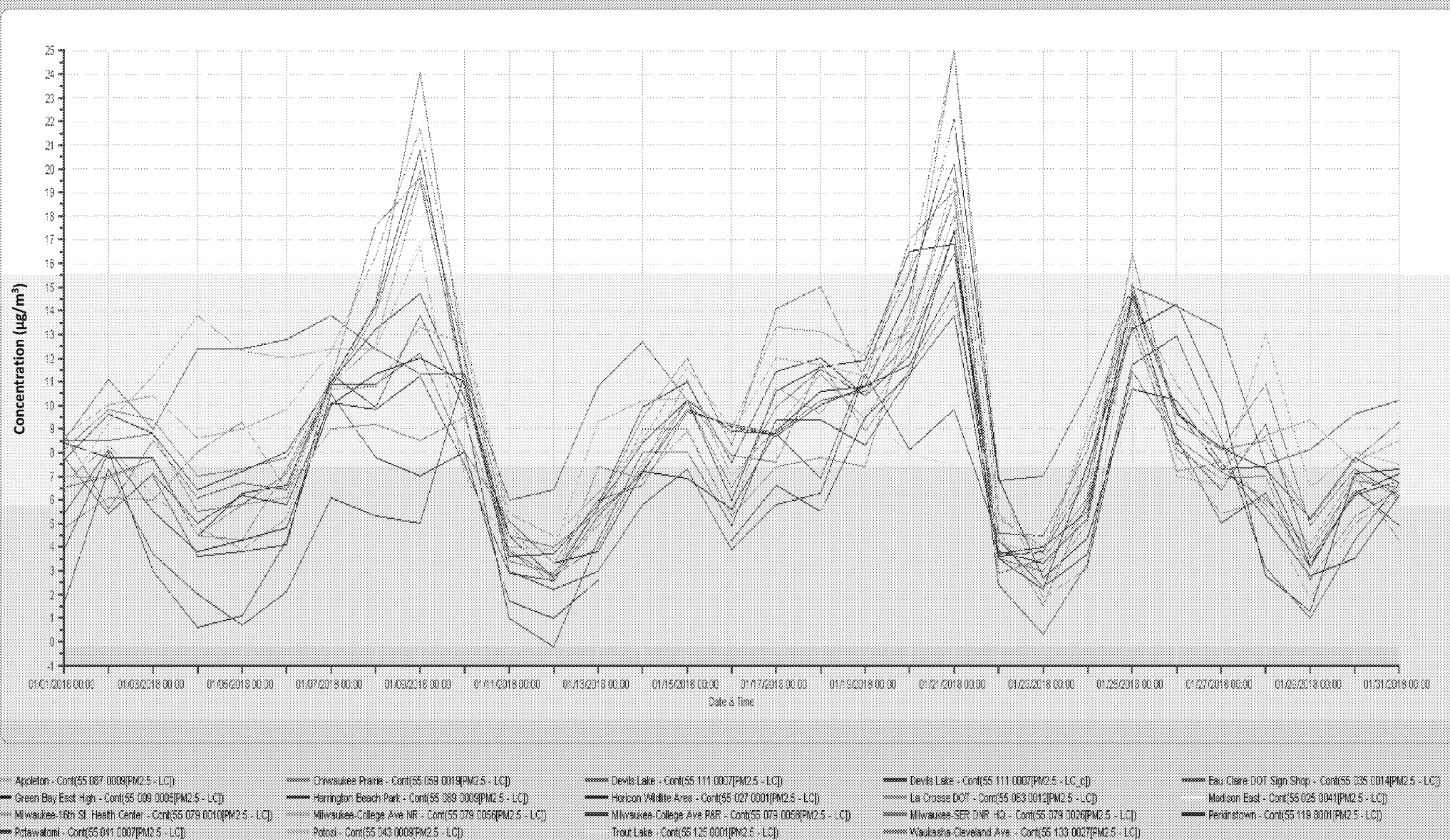


Figure 4: Annual PM_{2.5} 2015-2017 Design Values Compared to the NAAQS

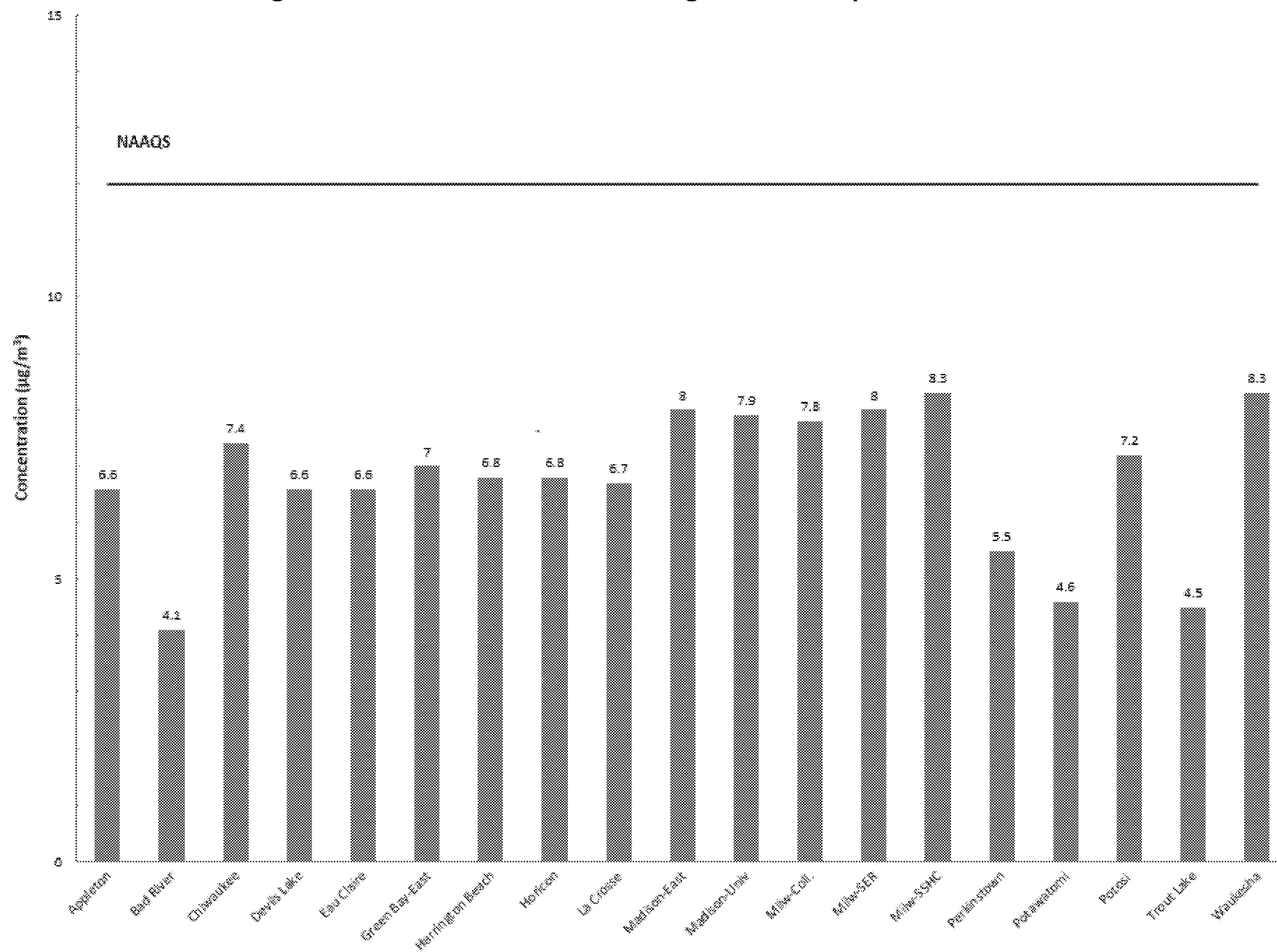
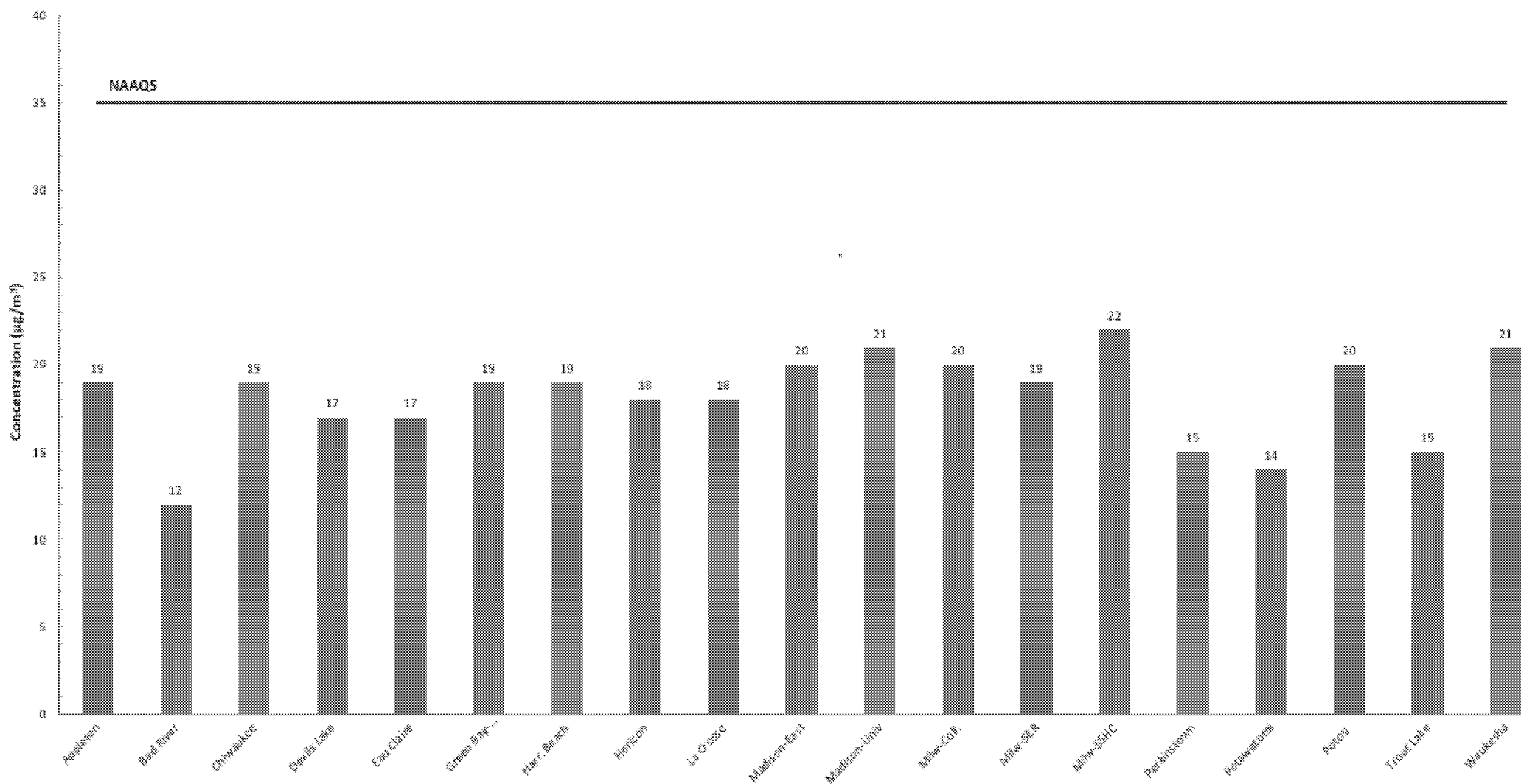


Figure 5: 24-hour PM_{2.5} 2015-2017 Design Values Compared to the NAAQS



Coarse Particulate Matter (PM_{10-2.5}) Network

The national monitoring requirements defined in Appendix D of 40 CFR Part 58 contain a requirement for PM_{10-2.5} mass monitoring to be conducted at NCore multipollutant monitoring sites. The DNR monitors for PM_{10-2.5} at the NCore site at Horicon as well as two additional sites (Milwaukee SER Hqrtrs and Devils Lake Park) for a total of three sites. No additional sites are anticipated at this time.

PM₁₀ Network

PM₁₀ includes all particles with an aerodynamic diameter less than 10 microns. The DNR currently operates PM₁₀ FRM monitors at five monitoring sites. This method collects mass samples of PM₁₀ over a 24-hour period once every six days.

Wisconsin, also, operates continuous PM₁₀ FEM monitors that measure hourly PM₁₀ concentrations at three sites: Devils Lake Park, Horicon Wildlife Area and Milwaukee SER DNR Hdqrs. At these sites, a monitor measures PM₁₀ and calculates concentrations in both local conditions (LC) and at Standard Temperature and Pressure (STP). The LC measurements are appropriate for calculating coarse particle concentrations but are not appropriate for comparison with the NAAQS.

Figure 6 shows the locations of the PM₁₀ monitors in Wisconsin in 2018. Significant changes are anticipated in both the FRM and FEM PM₁₀ networks.

Wisconsin currently meets applicable NAAQS for PM₁₀ at sites with three years of complete data. A monitoring site meets the 24-hour PM₁₀ NAAQS when the level of 150 µg/m³ is not exceeded more than once per year on average over 3-years.

To illustrate the daily PM₁₀ measurements, Figure 7 shows the 2015-2017 highest daily PM₁₀ concentrations at Wisconsin sites. The Wisconsin values in Milwaukee ranged from 33 µg/m³ in Milwaukee to 57 µg/m³ in Milwaukee.

Total Suspended Particulate (TSP)

TSP includes the total mass of particles of solid or liquid matter - such as soot, dust, aerosols, fumes, and mist - found in a sample of ambient air. TSP was one of the original NAAQS; however, it was replaced in 1987 by the PM₁₀ standard at the national level. The DNR monitors for TSP at a single site in Kohler to meet lead monitoring requirements. With the conclusion of monitoring in 2018, TSP monitoring for lead in Wisconsin will satisfy all federal requirements for discontinuation therefore, further changes to this network are anticipated.

Lead (Pb)

Lead (Pb) is a metal found naturally in the environment as well as in manufactured products. Wisconsin monitors lead to compare source-oriented lead concentrations to the federal lead NAAQS. The collocated monitors at Kohler are high-volume TSP samplers and data from these monitors are compared to the NAAQS. Since 2010 lead concentrations measured at these collocated monitors meet the 2008 Pb NAAQS of 0.15 µg/m³ for a 3-month period. The 3-year maximum rolling 3-month average concentration at Kohler for 2015 – 2017 is 0.05 µg/m³.

Figure 6: 2018 PM₁₀ Monitoring Sites in Wisconsin

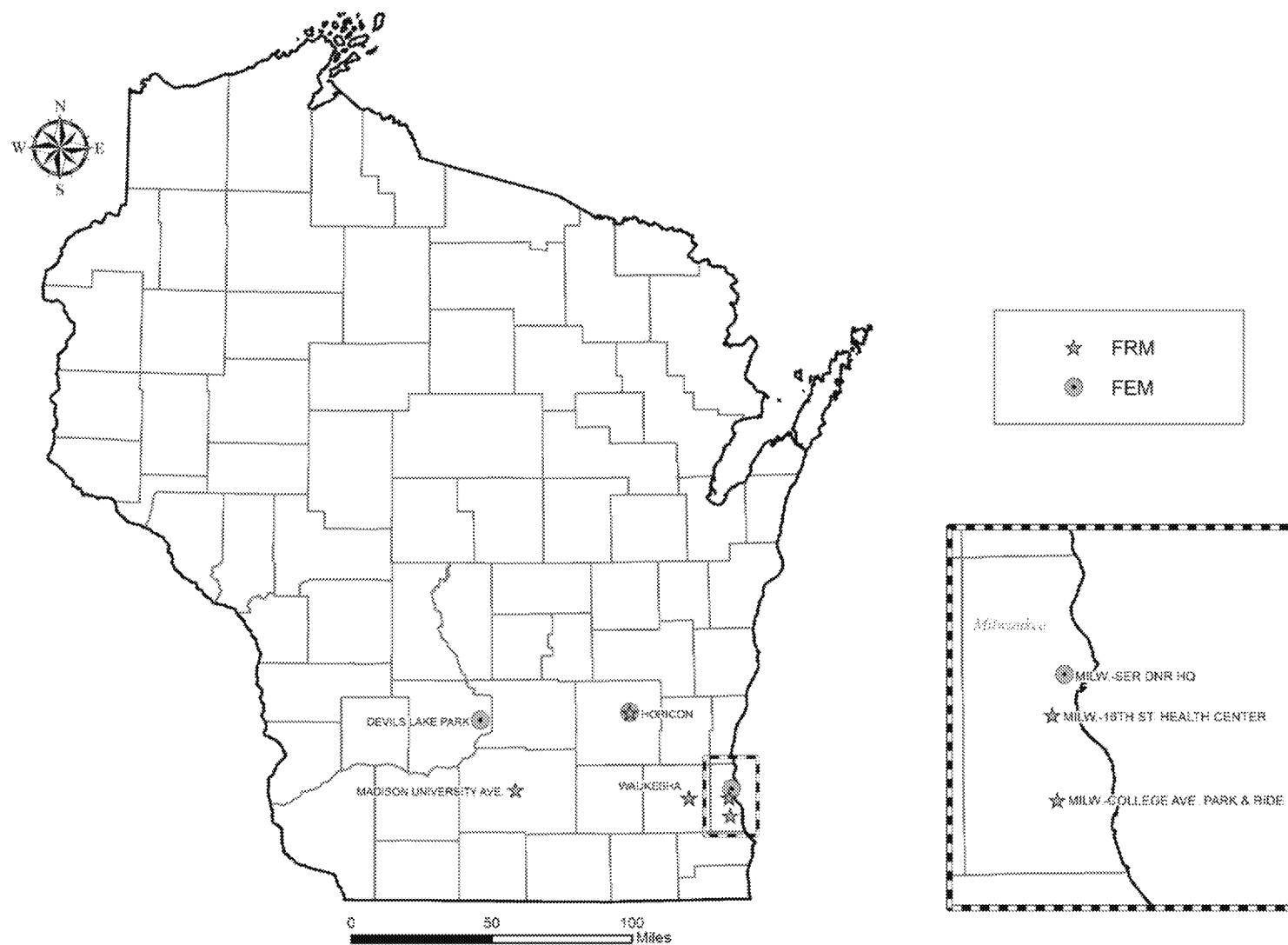
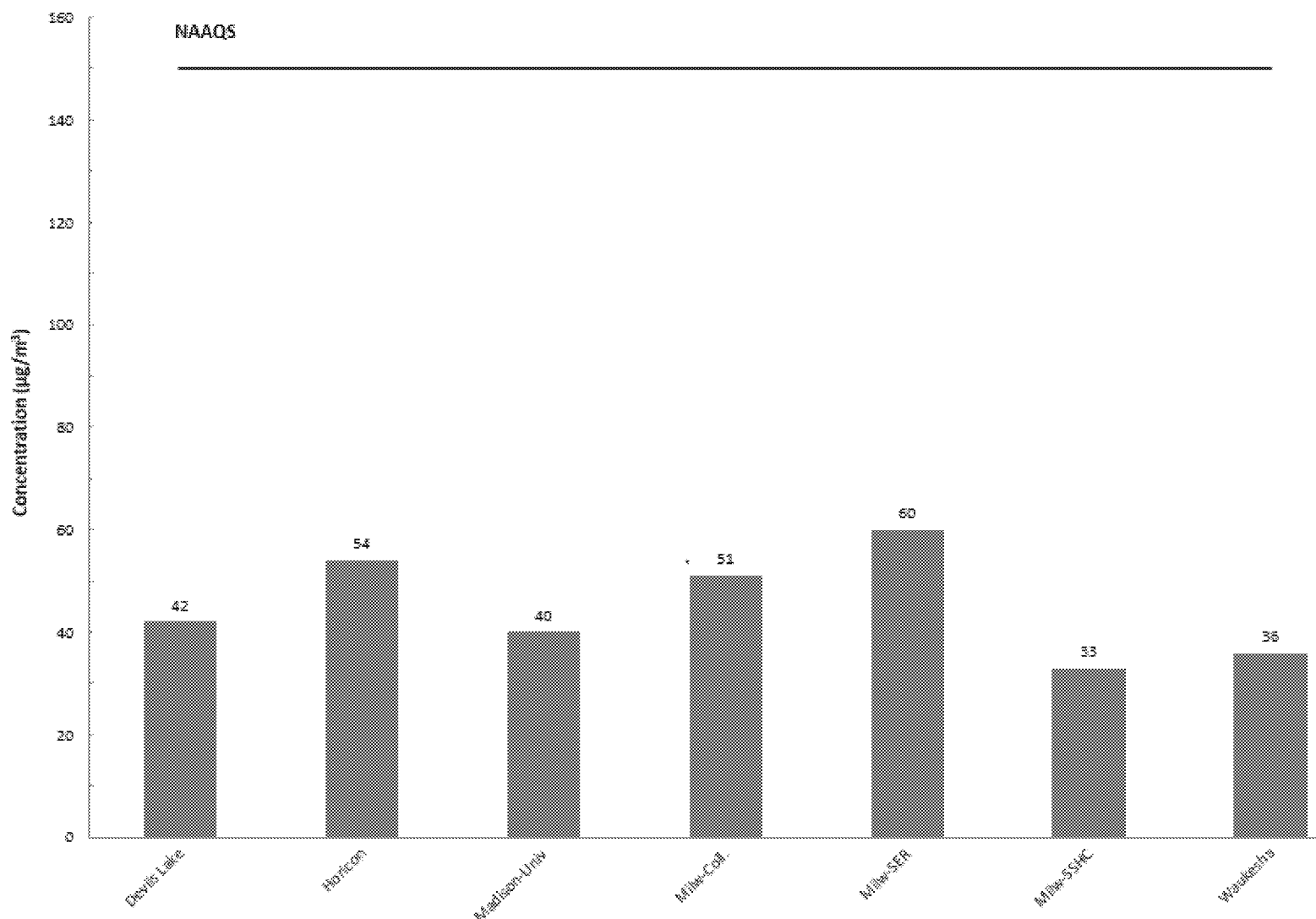


Figure 7: Max 24-hour PM₁₀ Concentrations Compared to the NAAQS Based on 2015-2017

Ozone (O₃)

O₃ is an odorless, colorless gas composed of three atoms of oxygen. Ground-level O₃ is not emitted directly into the air, but is created through a reaction of NO_x and VOCs in the presence of sunlight.

On October 26, 2015, EPA published its final rule for new NAAQS for ozone that revised the 8-hour ozone standard to 70 ppb. This rule took effect on December 28, 2015. The rule also included changes to ozone monitoring requirements such as:

- Streamlining and modernizing the PAMS network requirements.
- Changing the length of the ozone monitoring season in Wisconsin.

Because O₃ formation typically requires high temperatures and sunny conditions, the EPA only requires Wisconsin to monitor O₃ seasonally with a few exceptions. Through 2016, the Wisconsin ozone season ran from April 15 – October 15 excluding Kenosha county sites whose season ran from April 1 – October 31. In 2017, with the implementation of the 2015 ozone new standard, the ozone monitoring season runs from March 1 through October 15 except for the two Kenosha county sites which monitor for an additional two weeks until October 31. Four sites measure ozone year-round: Bad River Tribal School – Odanah (55-003-0010), Horicon Wildlife Area (NCore) (55-027-0001), Milwaukee SER DNR Hdqrs (55-079-0026) and

Potawatomi (55-041-0007).

The DNR monitors ozone on a continuous basis at 29 monitoring sites (Figure 8) including two tribal sites. An additional CASTNET monitor located in Perkinstown is operated by the EPA. Since the DNR does not have any role in this monitor, it is not included in the SLAMS or AQI monitoring networks.

The data collected from these 29 monitors are used to determine compliance with the NAAQS and are reported as part of the AQI. Figure 8 shows the monitoring locations for O₃ in Wisconsin in 2018. The Lake Geneva site is expected to move before the end of 2019.

A monitoring site meets the primary O₃ NAAQS if the three-year average of the 4th highest daily maximum 8-hour concentration is less than or equal to 70 ppb. Figure 9 shows the 2015 through 2017, 4th highest daily maximum 8-hour averages at Wisconsin sites compared to the standard. Eight sites were above the 8-hour standard. All of these sites are located near the shore of Lake Michigan.

Figure 8: 2018 Ozone Monitoring Sites in Wisconsin

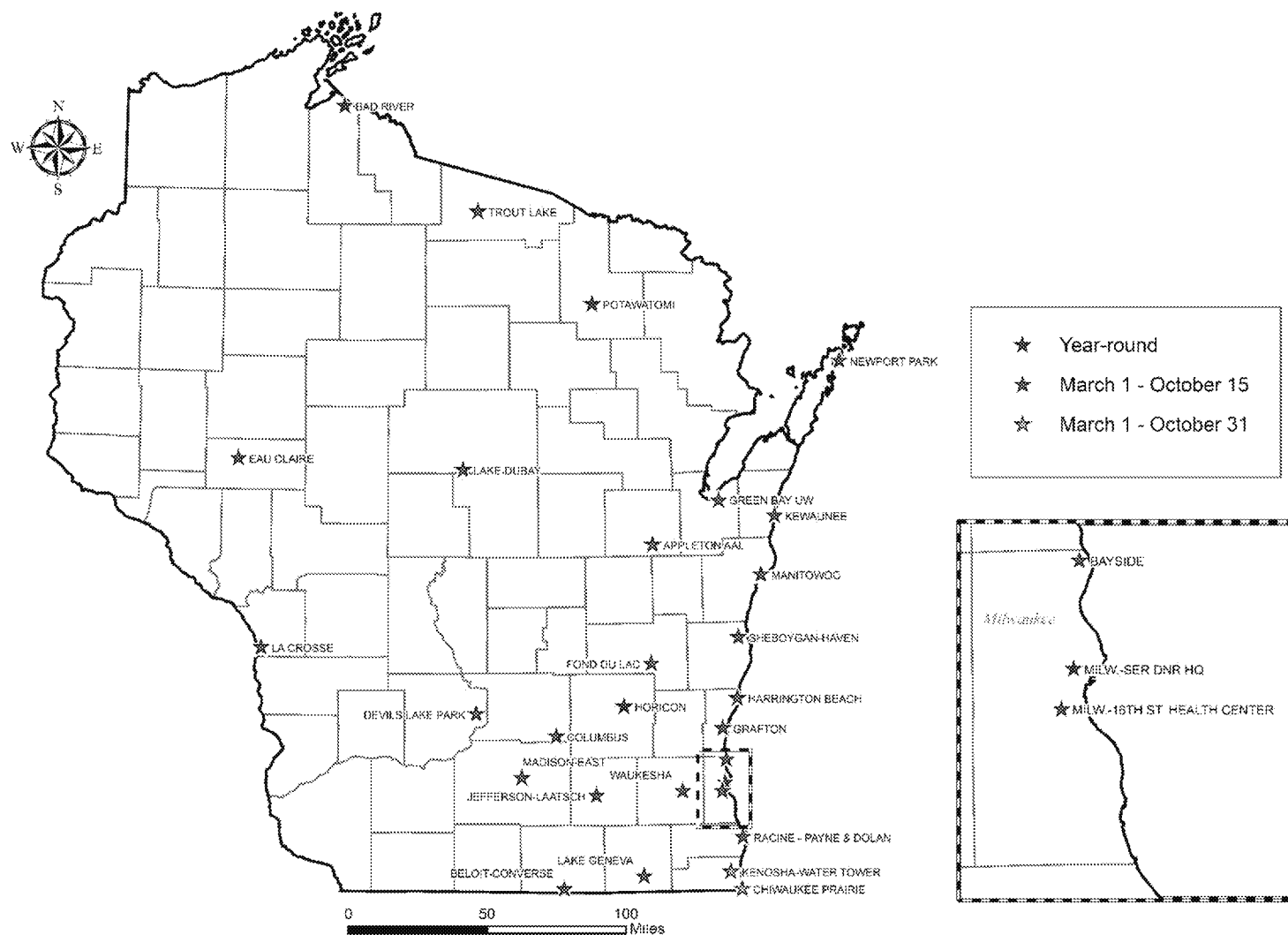
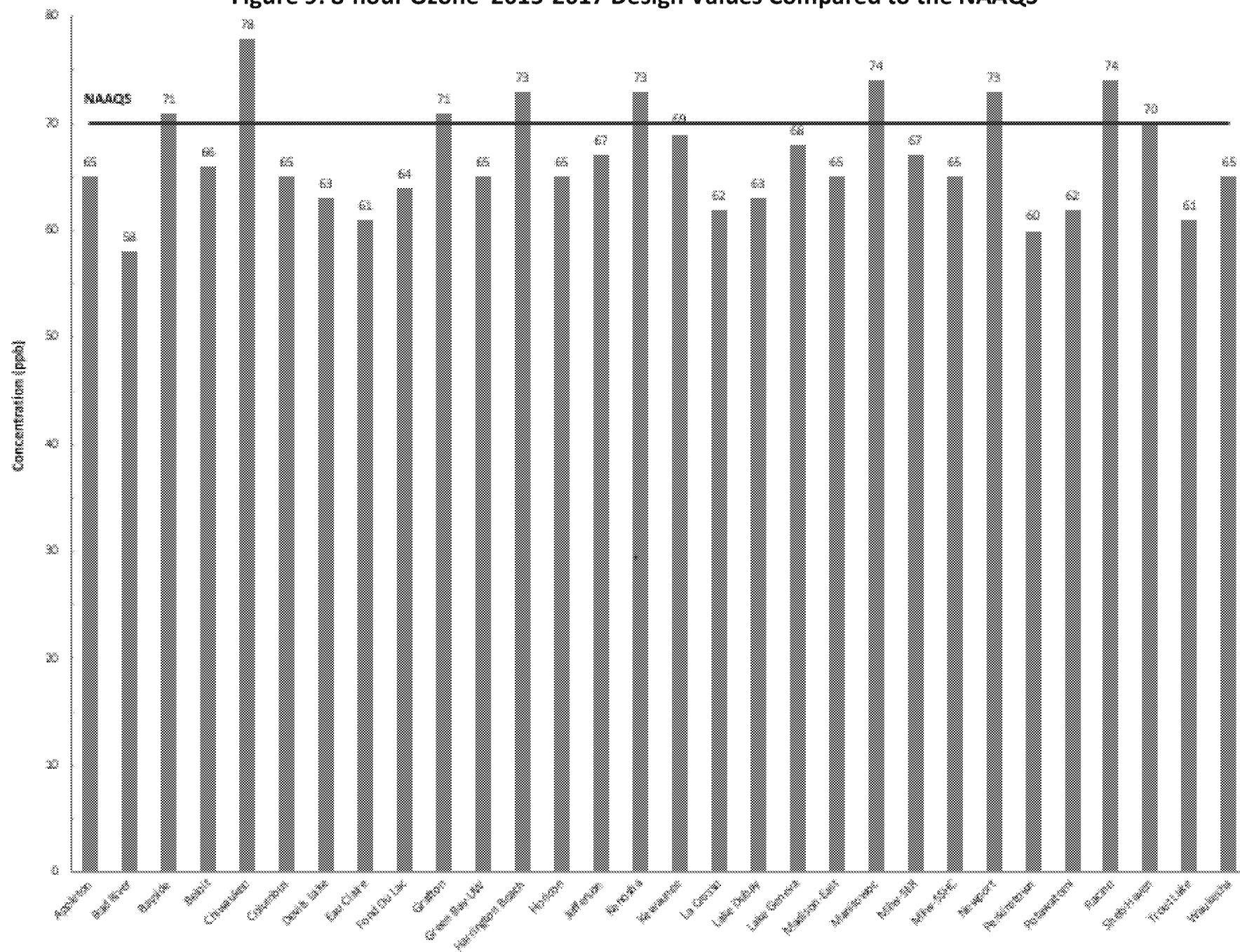


Figure 9: 8-hour Ozone 2015-2017 Design Values Compared to the NAAQS



Nitrogen Dioxide (NO₂)

Nitrogen oxides (NO_x) is the generic term for a group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. The two primary components are nitric oxide (NO) and nitrogen dioxide (NO₂). NO₂ is the regulated pollutant; it can often be seen as a reddish-brown layer in the air over urban areas.

On January 22, 2010, EPA finalized the health-based NAAQS for NO₂ at 100 ppb over a 1-hour averaging period and established new ambient air monitoring and reporting requirements. As part of the standard review process, the EPA retained the existing annual NO₂ NAAQS, but also created a new 1-hour standard. The new standard required NO₂ monitors near major roads in urban areas as well as in other locations where maximum concentrations were expected.

The near-road monitoring network was implemented in phases. Monitors in the first and second phases were deployed by January 1, 2014.

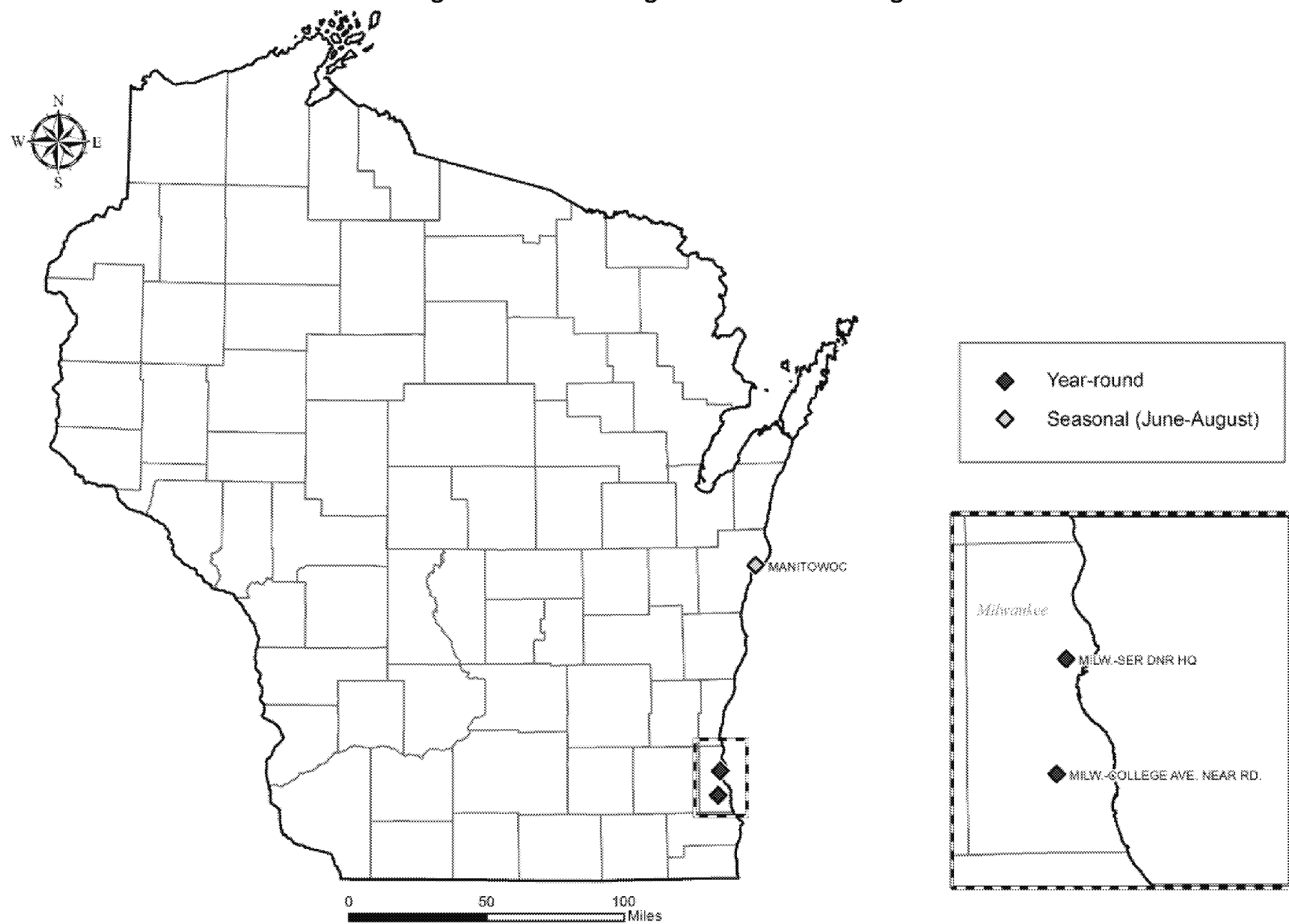
Specifically, requirements obligated Wisconsin to locate and operate a near-road NO₂ monitor in Milwaukee by January 1, 2014. The NO₂ monitor at the near-road site became operational on January 1, 2014. Complete details about near-road monitoring can be found on the DNR's web site at <http://dnr.wi.gov/topic/AirQuality/Monitor.html>. On December 30, 2016, EPA finalized The Revision to Near-Road Ambient Nitrogen Dioxide (NO₂) Monitoring Requirements which eliminated Phase 3 of this requirement. Phase 3 would have required a second monitoring station in Madison.

An additional community wide population-oriented NO₂ monitor and a seasonal (June – August) enhanced ozone NO_x monitor operate at the Milwaukee SER Hdqrs site (55-079-0026) and Manitowoc WdInd Dunes site (55-071-0007) respectively. Both of these sites, also, monitor for reactive oxides of nitrogen (NO_y) in June, July and August. Also, in August, 2017, a new monitor using a direct absorption method at the Milwaukee – College Ave. NR site (55-079-0056) began reporting. Figure 10 shows all NO₂ monitoring sites.

If the annual NO₂ average is less than or equal to 53 ppb, a monitoring site meets the annual NAAQS for NO₂. The Milwaukee SER Hdqrs (55-079-0026) and the Milwaukee – College Ave. NR site (55-079-0056) monitor for NO₂ year-round and are comparable with the NAAQS. The 2017 annual averages for the two sites are 9.5 ppb and 13.5 ppb respectively. Therefore, Wisconsin currently meets the annual NAAQS for NO₂.

To meet the hourly standard, the three-year average of the annual 98th percentile daily maximum 1-hour NO₂ concentration must not exceed 100 ppb. The Milwaukee SER Hdqrs (55-079-0026) and the Milwaukee – College Ave. NR site (55-079-0056) monitor for NO₂ year-round and are comparable with the NAAQS. The 2015-2017 averages of the annual 98th percentile daily maximum 1-hour NO₂ concentrations for the two sites are 43 ppb and 46 ppb respectively. Therefore, all Wisconsin sites currently meet the 1-hour NAAQS for NO₂.

Figure 10: 2018 Nitrogen Dioxide Monitoring Sites in Wisconsin



Sulfur Dioxide (SO₂)

SO₂ belongs to the family of sulfur oxide gases. SO₂ reacts with other chemicals in the air to form sulfate particles. SO₂ is monitored on a continuous basis and reported in hourly and 5-minute increments. Data are used to determine compliance with the NAAQS..

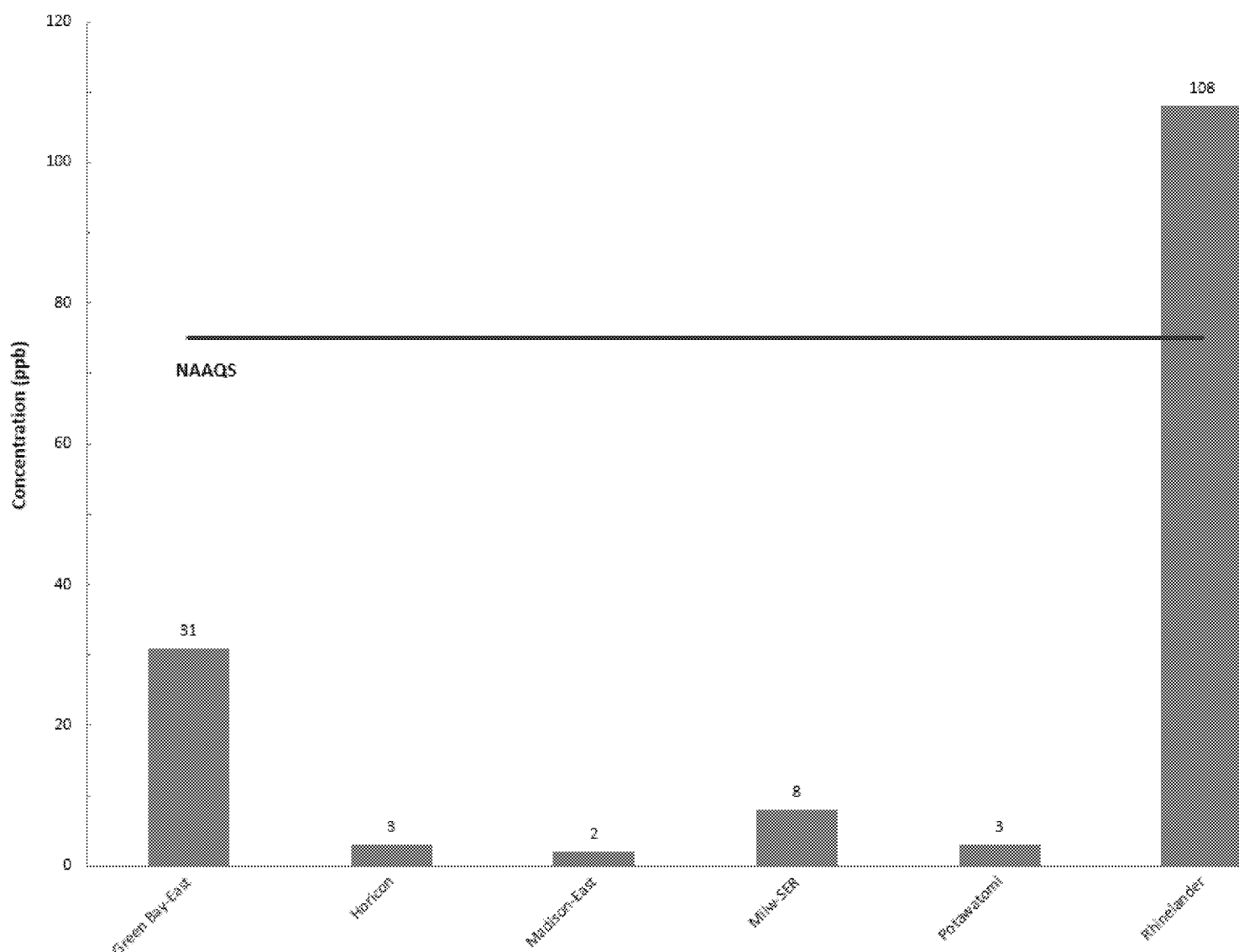
The DNR monitors SO₂ at seven sites shown in Figure 11. Trace level SO₂ at the NCore site at Horicon will help understand the role of SO₂ at levels far below the NAAQS.

On June 2, 2010, the EPA finalized revisions to the primary SO₂ NAAQS. EPA established a new 1-hour standard which is met if the three-year average of the annual 99th percentile daily maximum 1-hour SO₂ concentration is less than 75 ppb. In addition to creating the new 1-hour standard, the EPA revoked the existing 24-hour and annual standards. Figure 12 describes the 2015 -2017 average 99th percentile 1-hour SO₂ concentration and compares them to the 1-hour standard. Wisconsin averages ranged from 3 ppb in Horicon to 108 ppb in Rhinelander. Therefore, one site (Rhinelander, 55-085-0996) does not currently meet the 1-hour NAAQS for SO₂. DNR submitted the required attainment state implementation plan (SIP) for the Rhinelander SO₂ nonattainment area in January 2016 and the facility has taken actions needed to comply with that SIP. As a result, recent SO₂ levels at the Rhinelander monitor are below the NAAQS and the area is on track to attain the standard next year based on 2016-2018 design values.

On August 21, 2015, EPA published Data Requirements Rule for the 2010 1-hour SO₂ primary NAAQS. As established in the rule on April 13, 2016, EPA released a list of sources to be addressed under the rule. More detail about this source list can be found in Appendix A. In Wisconsin, this rule resulted in one industrial SO₂ site being established in Kaukauna: Expera Kaukauna (55-087-0015). This site does not yet have sufficient data to calculate a design value and has therefore not been compared against the NAAQS.

Figure 11: 2018 Sulfur Dioxide Monitoring Sites in Wisconsin



Figure 12: 1-hour Sulfur Dioxide 2015-17 Design Values Compared to the NAAQS

Carbon Monoxide (CO)

Carbon monoxide (CO) is a colorless and odorless toxic gas formed when carbon in fuels is not completely burned. Carbon monoxide is also oxidized to form carbon dioxide (CO₂) which contributes the formation of ground-level O₃.

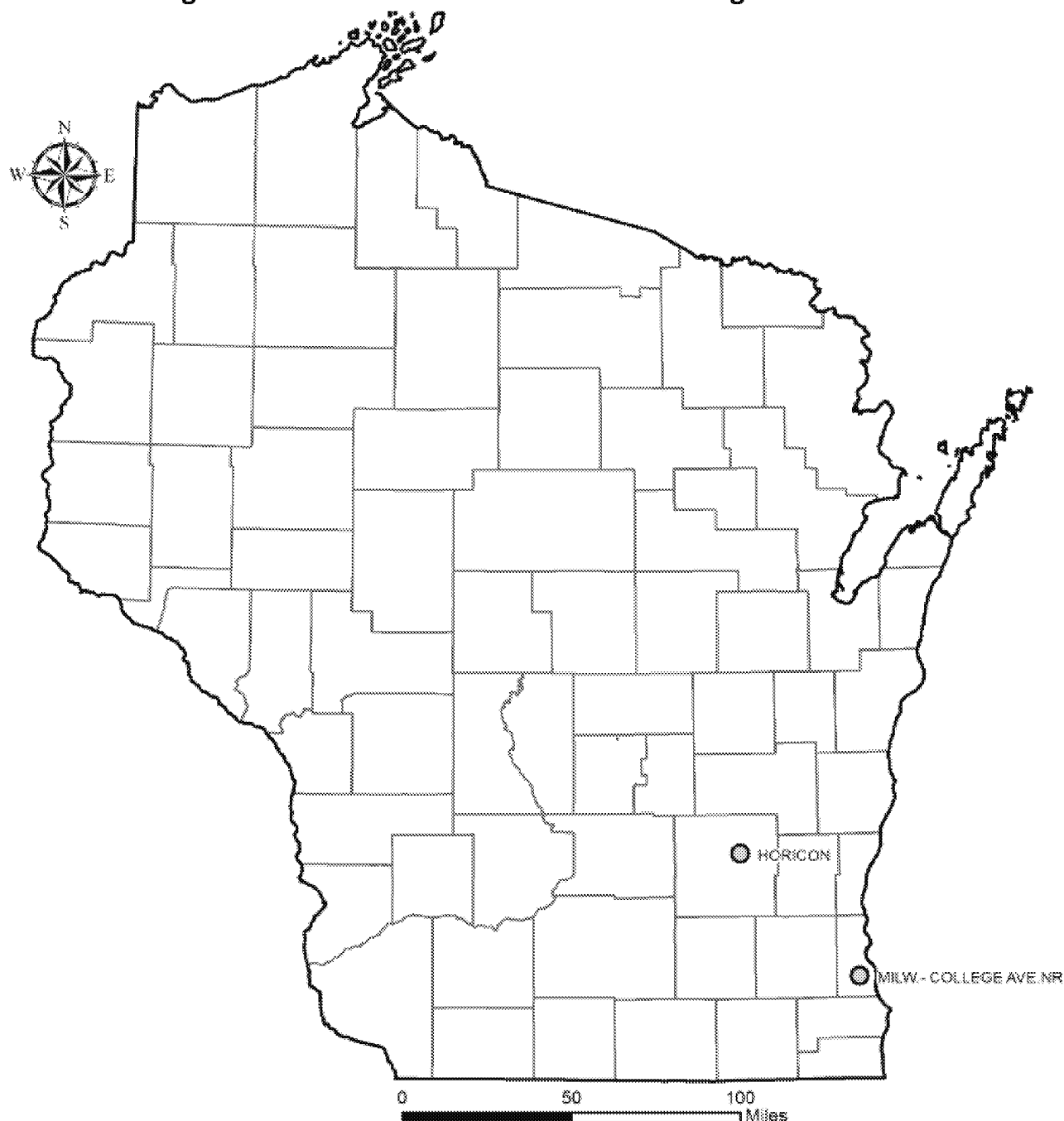
On August 31, 2011, EPA finalized a rule to retain the existing NAAQS for carbon monoxide (CO) and revise the monitoring requirements for CO. The rule required CO monitors to be sited near highly trafficked roads in certain urban areas having a population of 1 million or more. EPA required co-location of these CO monitors with NO₂ near-road monitors. For Wisconsin, this resulted in the requirement to add one CO monitor at the near-road monitoring site (55-079-0056) in Milwaukee on January 1, 2014.

The DNR monitors CO at two sites. See Figure 13. CO is monitored on a continuous basis and reported in hourly increments. Data are used to determine compliance with the NAAQS and are reported as part of the AQI. Trace level CO data at the NCore site at the Horicon Wildlife Area also help us understand the role of CO at levels far below the NAAQS.

Currently, Wisconsin meets applicable NAAQS for CO. A monitoring site meets the 8-hour CO NAAQS when the level of 9 ppm is not exceeded more than once per year. The Horicon Wildlife Area (55-027-0001) and the Milwaukee – College Ave. NR (55-079-0056) sites monitor for CO. Excluding data associated with a prairie burn near Horicon on April 10, the 2017 max 8-hr averages for the two sites are 0.3 ppm and 0.6 ppb respectively.

The 1-hour CO NAAQS is met when the level of 35 ppm is not exceeded more than once per year. The Horicon Wildlife Area (55-027-0001) and the Milwaukee – College Ave. NR (55-079-0056) sites monitor for CO. Excluding data associated with a prairie burn near Horicon on April 10, the 2017 max 1-hr averages for the two sites are 0.5 ppm and 0.8 ppb respectively.

Figure 13: 2018 Carbon Monoxide Monitoring Sites in Wisconsin



Air Toxics

Air toxics include, but are not limited to, the 190 Hazardous Air Pollutants (HAPs) specified in the 1990 CAA Amendments (see <http://www.epa.gov/ttn/atw/orig189.html> for a list of HAPs). In 1999, EPA finalized the Urban Air Toxics Strategy (UATS). The UATS states that emissions data are needed to quantify the sources of air toxics impacts and aid in the development of control strategies, while ambient monitoring data are needed to understand the behavior and concentration of air toxics in the atmosphere after they are emitted. Part of this strategy included the development of the National Air Toxics Trends Stations (NATTS). The NATTS program measures core air toxics pollutants including VOCs, carbonyls, metals, hexavalent chromium, and PAHs.

The DNR monitors four types of air toxics: seven metals, 35 volatile organic compounds (VOCs), 21 Polycyclic Aromatic Hydrocarbons (PAHs) and eight carbonyls. Samples are collected once every six days over a 24-hour period; the resulting concentration is a 24-hour average. The toxics monitoring sites appear in Figure 14.

Metals

Metals are extracted from PM₁₀ filters and analyzed using ICP-MS following an EPA FEM method. Table 9 lists the metals collected and reported by the DNR and analyzed by the Wisconsin State Lab of Hygiene (WSLH). The DNR monitors metals at two sites in Wisconsin. See Figure 14.

Table 9: 2018 Metals Monitored in Wisconsin

Parameter	EPA Parameter Code
Arsenic (As)	82103
Beryllium (Be)	82105
Cadmium (Cd)	82110
Lead (Pb)	84128
Manganese (Mn)	82132
Nickel (Ni)	82136

VOCs, Carbonyls and PAHs

The DNR analyzes samples for 35 VOCs, 8 carbonyls and 21 PAHs. Tables 10-12 lists the VOCs, carbonyls and PAHs. Samples are analyzed using EPA Compendium Methods TO-15 for VOCs, TO-11A for carbonyls and TO-13 for PAHs.

The DNR monitors VOCs, PAHs and Carbonyls at two sites in Wisconsin: Horicon Wildlife Area (55-027-0001) and Milwaukee Sixteenth St. Health Center (55-079-0010). See Figure 14.

Atmospheric Deposition

Atmospheric deposition is monitored through the NADP. The NADP has four active sub-networks in Wisconsin: the National Trends Network (NTN), the Mercury Deposition Network (MDN), Atmospheric Mercury Network (AMNet) and Ammonia Monitoring Network (AMoN).

Acid Deposition

Acid deposition, or acid rain, often contains SO₂ and NO_x and is monitored as part of the NTN.

The DNR sponsors several sites that are part of the NADP (<http://nadp.sws.uiuc.edu/>) to monitor acid rain. The purpose of the network is to collect data on the chemistry of precipitation for monitoring of geographical and long-term trends. The precipitation at each station is collected weekly and is sent to a national contract laboratory where it is analyzed for hydrogen (acidity as pH), sulfate, nitrate, ammonium, chloride, and cations

(such as calcium, magnesium, potassium, and sodium).

Wisconsin has six monitoring sites for wet deposition: Perkinstown operated by EPA, Potawatomi operated by the Forest County Potawatomi Community (FCPC), Spooner operated by United States Forest Service (USFS) and three DNR operated sites (Brule River, Devils Lake and Trout Lake). These sites are highlighted in Figure 15.

Mercury (Hg) Deposition

Mercury (Hg) contamination of fish is an important issue in Wisconsin. Mercury is monitored in wet deposition in Wisconsin as part of the NADP through the Mercury Deposition Network (MDN), which began in 1996 and now consists of over 85 sites. The MDN website can be found at <http://nadp.sws.uiuc.edu/mdn/>. The MDN collects weekly samples of precipitation, which are analyzed for total Hg. The objective of the MDN is to provide a nationally consistent survey of Hg in precipitation so that atmospheric loading to surface water can be quantified and long-term changes can be detected.

Wisconsin has four monitoring sites for wet deposition. Three sites are operated by the DNR: Brule River, Devils Lake and Trout Lake. A fourth site is operated by FCPC. These sites are highlighted in Figure 15.

Atmospheric Mercury Network (AMNet)

AMNet measures atmospheric mercury fractions which contribute to dry and total mercury deposition. There is an AMNet site located at Horicon operated by the DNR which has been active since January of 2010.

The DNR also cooperates with the states of Michigan and Minnesota to share the use of a trailer equipped with atmospheric Hg monitoring equipment. The equipment includes two Tekran 2537 Hg vapor analyzers, a generator, and a meteorological tower that can record wind speed and direction. The trailer is used to identify local sources of Hg vapor.

Ammonia Monitoring Network (AMoN)

This network measures ammonia gas concentrations across the United States. There are AMoN sites located at Horicon and Perkinstown. The Horicon site is operated by the DNR and has been active since January of 2007. The Perkinstown site is operated by EPA.

Figure 14: 2018 Air Toxics Monitoring Sites in Wisconsin

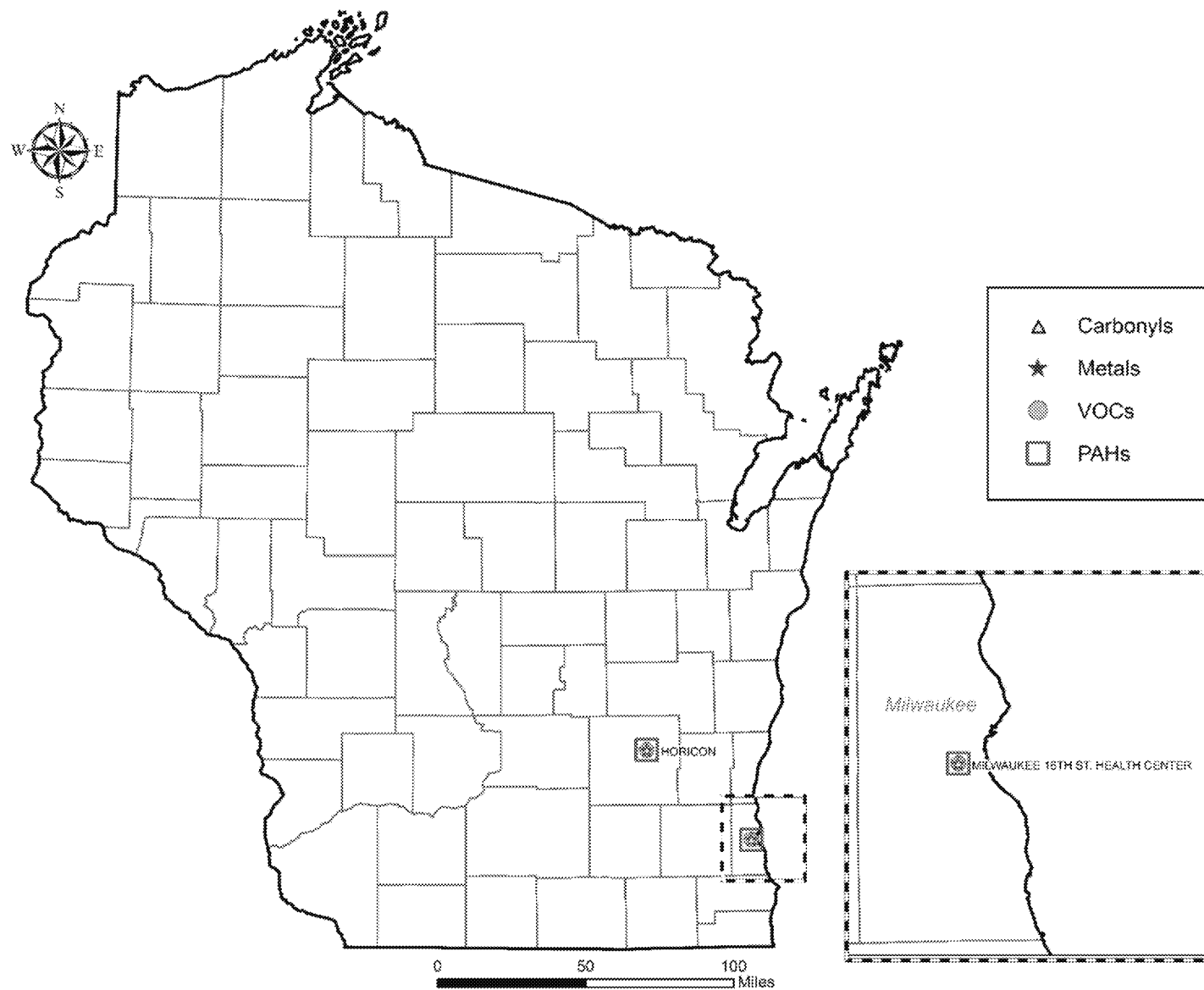


Table 10: 2018 VOCs Monitored in Wisconsin

Parameter	CAS #	EPA Parameter Code
1,1,1-Trichloroethane	71-55-6	43814
1,1,2,2-Tetrachloroethane	79-34-5	43818
1,1,2-Trichloroethane	79-00-5	43820
1,1-Dichloroethane	75-34-3	43813
1,2-Dibromoethane	106-93-4	43843
1,2-Dichlorobenzene	95-50-1	45805
1,2-Dichloroethane	107-06-2	43815
1,2-Dichloropropane	78-87-5	43829
1,2,4-Trimethylbenzene	95-63-6	45209
1,3-Butadiene	106-99-0	43218
1,3-Dichlorobenzene	541-73-1	45806
1,4-Dichlorobenzene	106-46-7	45807
Acrolein	107-02-8	43505
Benzene	71-43-2	45201
Bromodichloromethane	75-27-4	43828
Bromoform	75-25-2	43806
Bromomethane	74-83-9	43819
Carbon Tetrachloride	56-23-5	43804
Chlorobenzene	108-90-7	45801
Chloroethane	75-00-3	43812
Chloroform	67-66-3	43803
Chloromethane	74-87-3	43801
Cis-1,3-Dichloropropene	10061-01-5	43831
Dibromochloromethane	124-48-1	43832
Ethylbenzene	100-41-4	45203
Methylene Chloride	75-09-2	43802
n-Hexane	110-54-3	43231
Propene	115-07-1	-
Styrene	100-42-5	45220
Tetrachloroethene	127-18-4	43817
Toluene	108-88-3	45202
Trans-1,2-Dichloroethene	156-60-5	43838
Trans-1,3-Dichloropropene	10061-02-6	43830
Trichloroethene	79-01-6	43824
Vinyl Chloride	75-01-4	43860
m/p-Xylene	108-38-3	45109
o-Xylene	95-47-6	45204

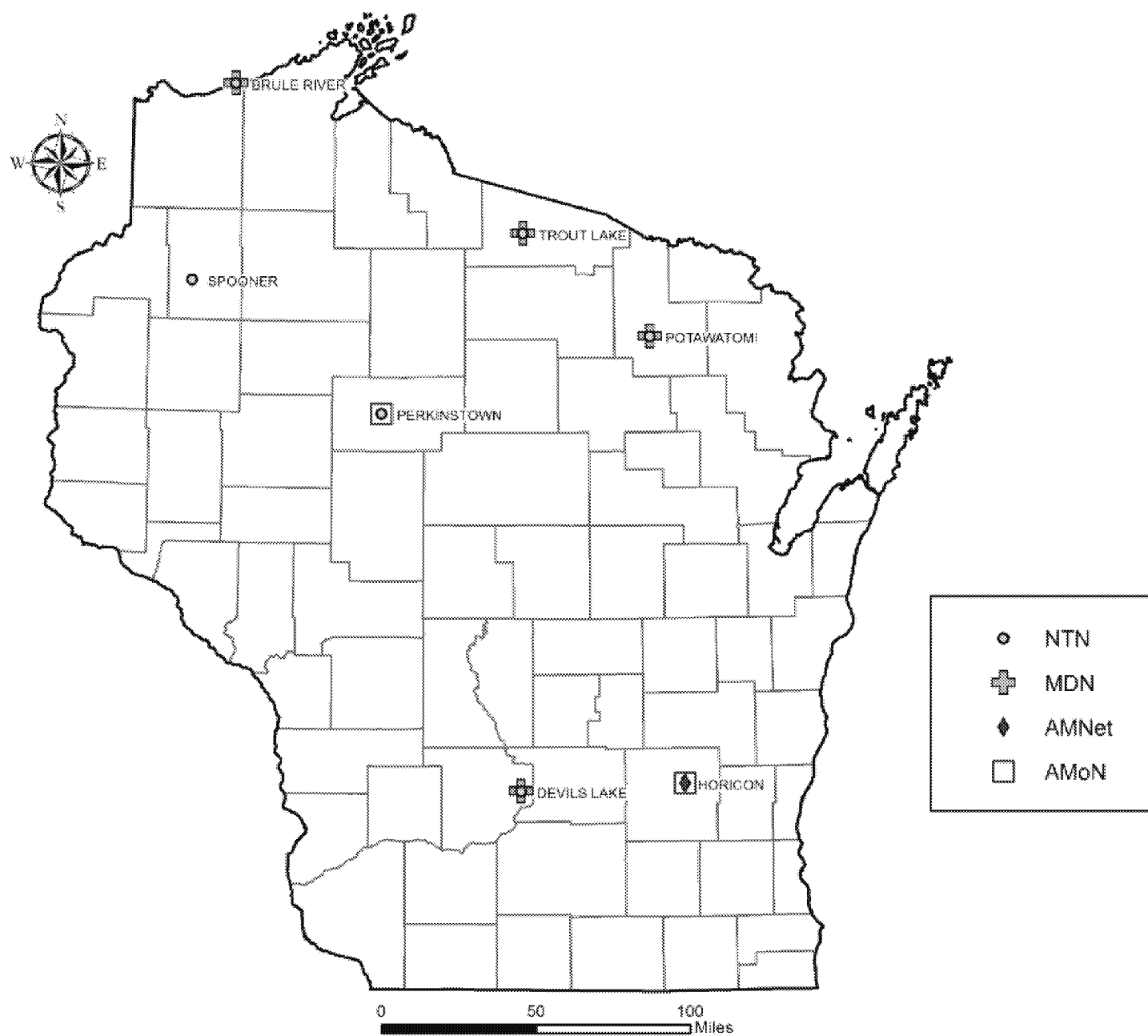
Table 11: 2018 Carbonyls Monitored in Wisconsin

Parameter	CAS #	EPA Parameter Code
Acetaldehyde	75-07-0	43503
Acetone	67-64-1	43551
Benzaldehyde	100-52-7	45501
Formaldehyde	50-00-0	43502
Hexanaldehyde	66-25-1	43517
Isovaleraldehyde	590-86-3	43513
Methyl Ethyl Ketone	78-93-3	43552
Propionaldehyde	123-38-6	43504
Valderaldehyde	110-62-3	-

Table 12: 2018 PAHs Monitored in Wisconsin

Parameter	CAS #	EPA Parameter Code
1-Methylnaphthalene	90-12-0	16938
27dimethylnaphthale	582-16-1	17140
2-Methylnaphthalene	91-57-6	45852
Acenaphthene(Tsp)	83-32-9	17147
Acenaphthylene(Tsp)	208-96-8	17148
Anthracene(Tsp) STP	120-12-7	17151
Benzo[A]Anthracene	56-55-3	17215
Benzo[A]Pyrene(Tsp)	50-32-8	17242
Benzo[B]Fluoranthene	205-99-2	17220
Benzo[E]Pyrene(Tsp)	50-32-8	17224
Benzo[G,H,I]Perylen	191-24-2	17237
Benzo[K]Fluoranthene	207-08-9	17223
Chrysene (Tsp) STP	218-01-9	17208
Dibenzo[Ah]Anthracene	53-70-3	17231
Fluoranthene(Tsp)	206-44-0	17201
Fluorene (Tsp) STP	86-73-7	17149
Indeno[123cd]Pyrene	193-39-5	17243
Naphthalene(Tsp)STP	91-20-3	17141
Phenanthrene (Tsp)	85-01-8	17150
Pyrene (Tsp) STP	129-00-0	17204
Retene (Tsp) STP	483-65-8	17158

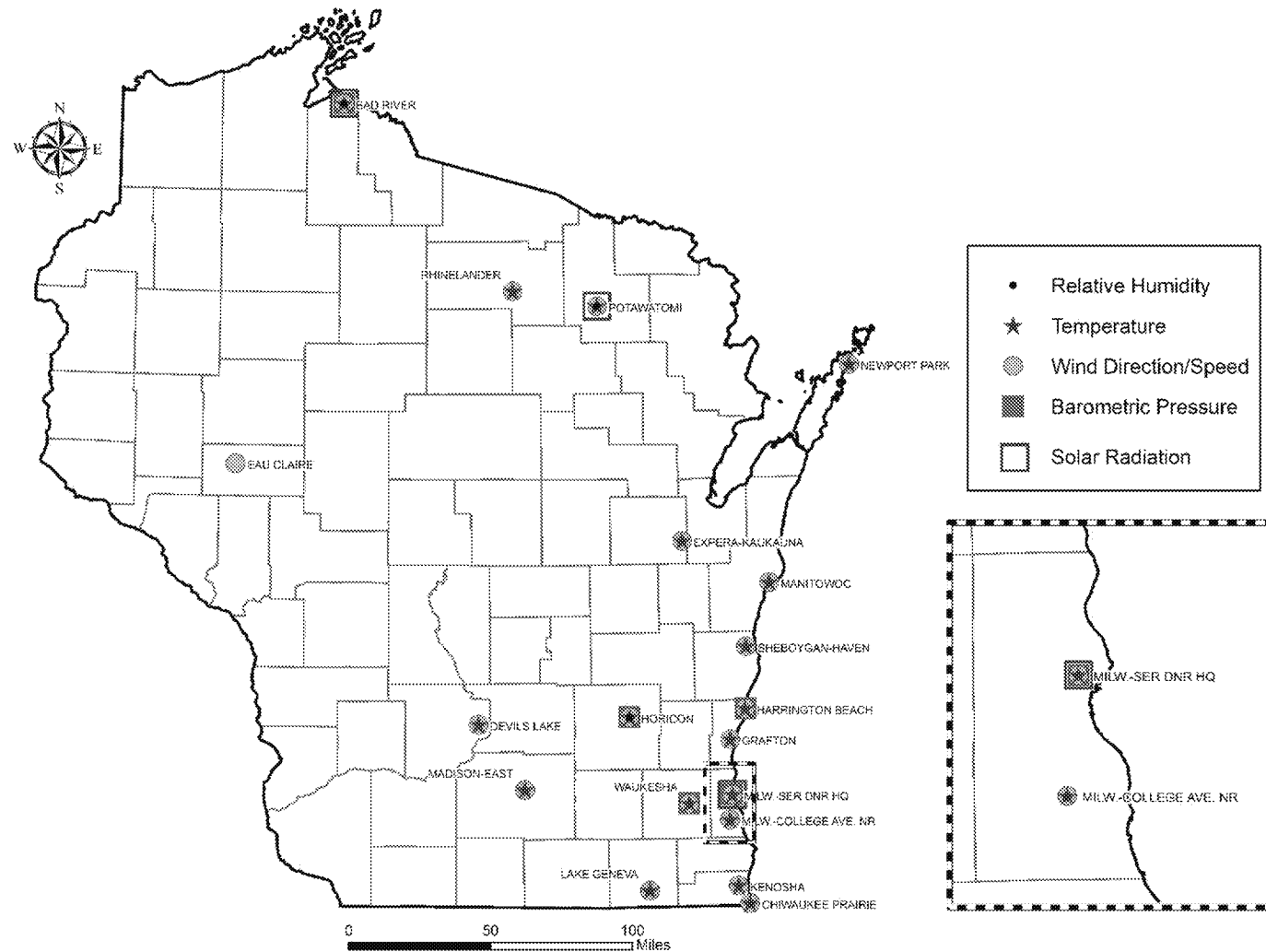
Figure 15: 2018 Atmospheric Deposition Sites in Wisconsin



Meteorological Data

Air pollution concentrations are strongly influenced by atmospheric conditions. Meteorological data can be an important tool for understanding and interpreting concentration data. The DNR collects hourly wind speed and wind direction data at 19 sites; and temperature data at 18 sites including two tribal sites. Barometric pressure, relative humidity and solar radiation data are collected at a few sites. See Figure 16 for details.

Figure 16: 2018 Meteorological Sites in Wisconsin



Network Changes

Changes to the DNR Air Monitoring Network are intended to improve the effectiveness of monitoring efforts and to ensure compliance with the EPA National Ambient Air Monitoring Strategy. Some changes are planned well in advance and are detailed in the Network Plan each year. This section of the document contains all changes that are planned for May 1, 2018 through December 31, 2019. In Appendix F, the planned and actual changes from the 2018 network plan are detailed.

Some changes cannot be anticipated due to unforeseen circumstances including; severe weather, legislation, administrative directives, land-use and ownership changes, loss of funding, enforcement actions or complaints. If resources are available and state law is satisfied, DNR will attempt to revive the impacted site. If the site must be moved, DNR will attempt to find a nearby location satisfying all siting criteria that can replace the problematic site.

Proposed Network Changes (May 1, 2018 – December 31, 2019)

Table 13 lists the proposed network changes from May 1, 2018 to December 31, 2019 by parameter network. Details of the proposed changes are presented below.

- In 2018, shutdown of Kohler (55-117-0008) lead monitors.
- Implement Enhanced Ozone Monitoring Plan
- At Milwaukee - College Ave. NR site (55-079-0056), add PM₁₀ FEM monitor.
- At Milwaukee College Ave. Park & Ride site (55-079-0058), remove PM₁₀ FRM monitors.
- At Milwaukee Sixteenth St. Health Center site (55-079-0010), add PM₁₀ FRM monitor for collocation needs.
- Transfer operation of Expera – Kaukauna site (55-087-0015) to DNR.
- Move Lake Geneva site (55-127-0005).
- Shutdown and start-up of industrial monitors.
- Transition from PM_{2.5} and PM₁₀ FRMs to continuous FEMs
- Transition PM_{2.5}, FEMs, PM₁₀ FEMs and PM₁₀₋₂₅ monitors to newer methodology (i.e. broadband spectroscopy)
 - Teledyne API T640 PM mass monitors will replace BAMs at Chiwaukee Prairie Stateline (55-059-0019), Eau Claire-DOT Sign Shop (55-035-0014), Harrington Beach (55-089-0009), La Crosse (55-063-0012), Madison - East (55-025-0041), Perkinstown (55-119-8001), Potosi (55-043-0009) and Trout Lake (55-125-0001).
 - Teledyne API T640X PM mass monitors will replace BAMs as well as some filter based PM_{2.5} and PM₁₀ monitors at Madison -University Ave. Well #6 (55-025-0047), Horicon Wildlife Area (55-027-0001), Milwaukee SER DNR Hdqrs (55-079-0026) and Milwaukee - College Ave. NR (55-079-0056). Waukesha-Cleveland Ave. (55-133-0027) will collocate a BAM and T640X for comparison.
 - All Collocation requirements have been considered and will be met during this transition.
- According to 2017 Wisconsin Act 159, WI Statute 285.72(3)(a), all reference to the air monitoring site located at Kohler-Andrae State park was excluded from this plan.

Table 13: Proposed Network Changes (May 1, 2018 - December 31, 2019)

Monitoring Site	AQS Site ID	Site	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb - TSP	Carbon	Meteorological	Metals (PM ₁₀)	NOy	PAH	VOC / Carbonyl	Hg	AMNet	AmoN	MDN	NTN	IMPROVE
Appleton AAL	55-087-0009																					
Bad River Tribal School – Odanah	55-003-0010																					
Chiwaukee Prairie Stateline	55-059-0019			M4																		
Columbus	55-021-0015																					
Devils Lake	55-111-0007																					
Eau Claire-DOT Sign Shop	55-035-0014			M4																		
Expera - Kaukauna	55-087-0015	M3					M3					M3										
Green Bay East High	55-009-0005																					
Harrington Beach	55-089-0009			M4																		
Horicon Wildlife Area	55-027-0001			M5	M5	M5																
Kenosha-Water Tower	55-059-0025																					
Kohler	55-117-0008	T																				
La Crosse	55-063-0012			M4																		
Lake DuBay	55-073-0012																					
Lake Geneva	55-127-0005	V																				
Madison - East	55-025-0041			M4																		
Madison -University Ave. Well #6	55-025-0047			M6	M6	A7																
Manitowoc Woodland Dunes	55-071-0007																					
Milwaukee - College Ave. NR	55-079-0056			M5	A7	A7																
Milwaukee College Ave. Park & Ride	55-079-0058				T 1,1																	
Milwaukee SER DNR Hdqrs	55-079-0025			M5	M5	M5																
Milwaukee Sixteenth St. Health Center	55-079-0010				A1																	
Perkinstown	55-119-8001			M4																		
Potawatomi	55-041-0007																					
Potosi	55-043-0009			M4																		
Rhineland Tower	55-085-0996																					
Trout Lake	55-125-0001			M4																		

Waukesha-Cleveland Ave.	55-133-0027			M5&A6	A7, A7	A7,A7													
-------------------------	-------------	--	--	-------	--------	-------	--	--	--	--	--	--	--	--	--	--	--	--	--

A = Addition

M = Modification

T = Termination

V = Move

1 = FRM

2 = Adjust sampling frequency

3 = Change operator

4 = Replace BAM with T640

5 = Replace BAM with T640X

6 = Replace FRM and HiVol with T640X

7 = T640X

Appendix A:

Minimum Monitoring Requirements and 2018 Monitor Classifications

Summary

The EPA establishes the minimum number of monitoring sites required to meet national ambient monitoring objectives. The minimum monitoring requirements are codified in Appendix D of 40 CFR Part 58. Minimum monitoring requirements are specific to each individual pollutant (e.g. ozone, PM_{2.5}) or objective based (e.g. NCore, PAMS) monitoring network. Minimum monitoring requirements typically rely on population and/or air pollution emissions data. Wisconsin currently meets all minimum air monitoring requirements. This appendix provides a detailed description of these requirements. It also provides tables that describe each monitor's scale, objective, method, and collocation where required. There are not any Prevention of Significant Deterioration (PSD) monitors in Wisconsin.

Federal Regulation

40 CFR § 58.10(a) (1) Annual monitoring network plan and periodic network assessment Beginning July 1, 2007, the State, or where applicable local, agency shall adopt and submit to the Regional Administrator an annual monitoring network plan which shall provide for the establishment and maintenance of an air quality surveillance system that consists of a network of SLAMS monitoring stations including FRM, FEM, and ARM monitors that are part of SLAMS, NCore stations, STN stations, State speciation stations, SPM stations, and/or, in serious, severe and extreme ozone nonattainment areas, PAMS stations, and SPM monitoring stations. The plan shall include a statement of purpose for each monitor and evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E of this part, where applicable. The annual monitoring network plan must be made available for public inspection for at least 30 days prior to submission to EPA.

Table of Contents

Summary.....	1
Federal Regulation.....	1
Table of Contents	2
List of Tables.....	2
PM _{2.5}	4
Fine Particle (PM _{2.5}) Monitoring Requirements.....	4
PM ₁₀	11
PM ₁₀ Monitoring Requirements.....	11
TSP	16
TSP Monitoring Requirements.....	16
Lead	17
Lead Monitoring Requirements	17
Ozone.....	18
Ozone Monitoring Requirements	18
Carbon Monoxide.....	24
Carbon Monoxide Monitoring Requirements.....	24
Nitrogen Dioxide.....	26
Nitrogen Dioxide Monitoring Requirements	26
Sulfur Dioxide	28
Sulfur Dioxide Monitoring Requirements	28

List of Tables

Table 1: PM _{2.5} Minimum Monitoring Requirements	4
Table 2: PM _{2.5} Collocation Requirements Demonstrated Using the Collocation Procedure with a PQAQ Having One Type of Primary and Multiple Primary FEMs ¹⁻⁴	5
Table 3: Wisconsin PM _{2.5} Monitoring Requirements.....	5
Table 4: Scales and Objectives of PM _{2.5} Monitors	7
Table 5: Sampling Frequencies, Durations, Methods and Collocations of PM _{2.5} monitors.....	9
Table 6: PM ₁₀ Minimum Monitoring Requirements (number of stations per MSA) ¹	11
Table 7: Wisconsin PM ₁₀ Monitoring Requirements	11
Table 8: Scales and Objectives of DNR PM ₁₀ Monitors	13
Table 9: Scales and Objectives of Industrial PM ₁₀ Monitors	13
Table 10: Sampling Frequencies, Durations, Methods and Collocations of DNR PM ₁₀ Monitors.....	14

Table 11: Sampling Frequencies, Durations, Methods and Collocations of Industrial PM ₁₀ Monitors	15
Table 12: Scales and Objectives of DNR and Industrial TSP Monitors	16
Table 13: Sampling Frequencies, Durations, Methods and Collocations of DNR TSP Monitors	16
Table 14: Sources with 2016 Annual Lead Emissions greater than 0.5 TPY	17
Table 15: Scales and Objectives of Industrial TSP Monitors.....	17
Table 16: Sampling Frequencies, Durations, Methods and Collocations of Industrial TSP Monitors	17
Table 17: Ozone Minimum Monitoring Requirements	18
Table 18: Wisconsin Ozone Monitoring Requirements.....	18
Table 19: Scales and Objectives of Ozone Monitors	20
Table 20: Methods and Seasons of Ozone Monitors	22
Table 21: Wisconsin Carbon Monoxide Monitoring Requirements	24
Table 22: Scales and Objectives of Carbon Monoxide Monitors	25
Table 23: Methods of Carbon Monoxide Monitors.....	25
Table 24: Nitrogen Dioxide Minimum Monitoring Requirements	26
Table 25: Wisconsin Nitrogen Dioxide Monitoring Requirements.....	26
Table 26: Scales and Objectives of Nitrogen Dioxide Monitors	27
Table 27: Methods of DNR Nitrogen Dioxide Monitors	27
Table 28: Sulfur Dioxide Minimum Monitoring Requirements	28
Table 29: Wisconsin Sulfur Dioxide Monitoring Requirements	28
Table 30: Scales and Objectives of DNR and Industrial Sulfur Dioxide Monitors.....	30
Table 31: Methods of DNR and Industrial Sulfur Dioxide Monitors.....	30
Table 32: Sources Subject to the 1-Hour SO ₂ NAAQS Data Requirements Rule	Error! Bookmark not defined.

PM_{2.5}

Fine Particle (PM_{2.5}) Monitoring Requirements

The minimum monitoring requirements for PM_{2.5} are established in Appendix D of 40 CFR Part 58 and are summarized in Tables 1 and 2. In addition to these population-based requirements, PM_{2.5} monitoring is required at NCore and near-road air monitoring sites. Wisconsin currently meets all PM_{2.5} monitoring requirements (see Table 2). Design values (DVs) used in Table 3 are the preliminary valid 2018 DVs calculated using the AQS AMP480 report on April 2, 2018. Scales and objectives of DNR and tribal PM_{2.5} monitors are summarized in Table 4. Scales and objectives of monitors have been updated using current information. In Table 5; sampling frequencies, durations, methods and collocations of DNR and Tribal PM_{2.5} monitors are summarized.

Currently, WDNR's primary monitors consist of seventeen beta attenuation Federal Equivalent Method (FEMs) monitors with a method code of 170 and three gravimetric Federal Reference Method (FRM) monitors with a method code of 145. Based on Table 3, the collocation requirements and monitors satisfying them are listed below:

- Two primary FEM monitors collocated with FRM monitors (12.5% of primary FEM monitors)
 - 55-079-0010-88101-3 collocated with 55-079-0010-88101-2
 - 55-133-0027-88101-3 collocated with 55-133-0027-88101-2
- One primary FEM monitor collocated with a FEM monitor of the same method designation (6.3% of primary FEM monitors)
 - 55-111-0007-88101-7 collocated with 55-111-0007-88101-8
- One primary FRM monitor collocated with a FRM monitor (33.3% of primary FRM monitors)
 - 55-079-0026-88101-1 collocated with 55-079-0026-88101-2

Table 1: PM_{2.5} Minimum Monitoring Requirements

MSA Population ^{1,2}	Most recent 3-year design value ≥ 85% of any PM_{2.5} NAAQS³	Most recent 3-year design value ≤ 85% of any PM_{2.5} NAAQS^{3,4}
> 1,000,000	3	2
500,000 – 1,000,000	2	1
50,000 - < 500,000 ⁵	1	0

1 = Minimum monitoring requirement applies to the Metropolitan statistical area (MSA).

2 = Population based on latest available census figures.

3 = The PM_{2.5} National Ambient Air Quality Standard (NAAQS) levels and forms are defined in 40 CFR part 50.

4 = These minimum monitoring requirements apply in the absence of a design value.

5 = Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

Table 2: PM_{2.5} Collocation Requirements Demonstrated Using the Collocation Procedure with a PQAQ Having One Type of Primary and Multiple Primary FEMs¹⁻⁴

#Primary FEMS of a unique method designation	# Collocated	# Collocated with a FRM	# Collocated with the same method designation
1 - 9	1	1	0
10 - 16	2	1	1
17 - 23	3	2	1
24 - 29	4	2	1
30 - 36	5	3	2
37 - 43	6	3	3

1 = A primary monitor designated as an EPA FRM shall be collocated with a quality control monitor having the same EPA FRM method designation.

2 = For each primary monitor designated as an EPA FEM used by the PQAQ, 50 percent of the monitors designated for collocation, or the first if only one collocation is necessary, shall be collocated with a FRM quality control monitor and 50 percent of the monitors shall be collocated with a monitor having the same method designation as the FEM primary monitor.

3 = If an odd number of collocated monitors is required, the additional monitor shall be a FRM quality control monitor.

4 = A site can only count for the collocation of the method designation of the primary monitor at that site.

Table 3: Wisconsin PM_{2.5} Monitoring Requirements

Metropolitan Statistical Area	2017 Population Estimate	Maximum 2017 Annual DV as % of Standard (12 µg/m ³)	Maximum 2017 Daily DV as % of Standard (35 µg/m ³)	Minimum Requirement	2019 Sites with FRM or FEM monitor
Chicago-Naperville-Elgin, IL-IN-WI ¹	9,533,040	88	71	3	24
Minneapolis-St. Paul-Bloomington, MN-WI ²	3,600,618	58	54	2	16
Milwaukee-Waukesha-West Allis, WI ³	1,576,236	69	63	3	6
Madison, WI ⁴	654,230	67	60	1	2
Green Bay, WI ⁵	320,050	58	54	0	1
Duluth, MN-WI ⁶	278,782	53	54	0	4
Appleton, WI ⁷	236,126	55	54	0	1
Eau Claire, WI ⁸	167,484	55	49	0	1
La Crosse-Onalaska, WI-MN ⁹	136,934	56	51	0	1
Racine, WI ¹⁰	196,071	Not applicable		0	0
Oshkosh-Neenah, WI ¹¹	170,414	Not applicable		0	0
Janesville-Beloit, WI ¹²	162,309	Not applicable		0	0
Wausau, WI ¹³	135,732	Not applicable		0	0
Sheboygan, WI ¹⁴	115,344	Not applicable		0	0

Metropolitan Statistical Area	2017 Population Estimate	Maximum 2017 Annual DV as % of Standard (12 µg/m ³)	Maximum 2017 Daily DV as % of Standard (35 µg/m ³)	Minimum Requirement
Fond du Lac, WI ¹⁵	102,548	Not applicable	0	0
NCore (Horicon)	Not a population based requirement		1	1
Near-road phase 2 (Milwaukee)	Not a population based requirement		1	1

1 = Counties include: Cook (IL), DeKalb (IL), DuPage (IL), Grundy (IL), Jasper (IN), Kane (IL), Kendall (IL), Kenosha (WI), Lake (IL), Lake (IN), McHenry (IL), Newton (IN), Porter (IN) and Will (IL)

2 = Counties include: Anoka (MN), Carver (MN), Chisago (MN), Dakota (MN), Hennepin (MN), Isanti (MN), Ramsey (MN), Scott (MN), Sherburne (MN), Washington (MN), Wright (MN), Pierce (WI), St. Croix (WI)

3 = Counties include: Milwaukee (WI), Ozaukee (WI), Washington (WI) and Waukesha (WI)

4 = Counties include: Columbia (WI), Dane (WI), Green (WI) and Iowa (WI)

5 = Counties include: Brown (WI), Kewaunee (WI) and Oconto (WI)

6 = Counties include: Carlton (MN), St. Louis (MN), Douglas (WI)

7 = Counties include: Outagamie (WI)

8 = Counties include: Chippewa (WI) and Eau Claire (WI)

9 = Counties include: Houston (MN) and La Crosse (WI)

10 = Counties include: Racine (WI)

11 = Counties include: Winnebago (WI)

12 = Counties include: Rock (WI)

13 = Counties include: Marathon (WI)

14 = Counties include: Sheboygan (WI)

15 = Counties include: Fond du Lac (WI)

Table 4: Scales and Objectives of PM_{2.5} Monitors

Site Name	AQS Monitor ID	Monitor Type	Parameter Description	Measurement Scale	Monitor Objective Type
APPLETON – AAL	55-087-0009-88101-3	SLAMS	PM2.5 - Local Conditions	Urban	Highest Concentration
BAD RIVER TRIBAL SCHOOL – ODANAH	55-003-0010-88101-1	TRIBAL	PM2.5 - Local Conditions	Regional	General/Background
CHIWAUKEE PRAIRIE STATELINE	55-059-0019-88101-3	SLAMS	PM2.5 - Local Conditions	Regional	Regional Transport
DEVILS LAKE PARK	55-111-0007-88101-7	SLAMS	PM2.5 - Local Conditions	Regional	General/Background
DEVILS LAKE PARK	55-111-0007-88101-8	SLAMS	PM2.5 - Local Conditions	Regional	Quality Assurance
EAU CLAIRE - DOT SIGN SHOP	55-035-0014-88101-3	SLAMS	PM2.5 - Local Conditions	Regional	Highest Concentration
GREEN BAY EAST HIGH	55-009-0005-88101-3	SLAMS	PM2.5 - Local Conditions	Urban	Highest Concentration
HARRINGTON BEACH PARK	55-089-0009-88101-3	SLAMS	PM2.5 - Local Conditions	Urban	Regional Transport
HORICON WILDLIFE AREA	55-027-0001-88101-1	SLAMS	PM2.5 - Local Conditions	Regional	Quality Assurance
HORICON WILDLIFE AREA	55-027-0001-88101-3	SLAMS	PM2.5 - Local Conditions	Regional	General / Background
LACROSSE - DOT BUILDING	55-063-0012-88101-3	SLAMS	PM2.5 - Local Conditions	Regional	Highest Concentration
MADISON - UNIVERSITY AVE WELL #6	55-025-0047-88101-1	SLAMS	PM2.5 - Local Conditions	Urban	Highest Concentration
MADISON EAST	55-025-0041-88101-1	SLAMS	PM2.5 - Local Conditions	Urban	Quality Assurance
MADISON EAST	55-025-0041-88101-3	SLAMS	PM2.5 - Local Conditions	Urban	Population Exposure
MILWAUKEE - COLLEGE AVE. NR	55-079-0056-88101-3	SLAMS	PM2.5 - Local Conditions	Neighborhood	Population Exposure
MILWAUKEE - COLLEGE AVE. PARK & RIDE	55-079-0058-88101-3	SLAMS	PM2.5 - Local Conditions	Urban	Regional Transport
MILWAUKEE - SER DNR HDQRS	55-079-0026-88101-1	SLAMS	PM2.5 - Local Conditions	Urban	Population Exposure
MILWAUKEE - SER DNR HDQRS	55-079-0026-88101-2	SLAMS	PM2.5 - Local Conditions	Urban	Quality Assurance
MILWAUKEE - SER DNR HDQRS	55-079-0026-88101-3	SLAMS	PM2.5 - Local Conditions	Urban	Population Exposure
MILWAUKEE - SIXTEENTH ST. HEALTH CENTER	55-079-0010-88101-2	SLAMS	PM2.5 - Local Conditions	Urban	Quality Assurance

Site Name	AQS Monitor ID	Monitor	Parameter Description	Measurement	Monitor Objective Type
MILWAUKEE - SIXTEENTH ST. HEALTH CENTER	55-079-0010-88101-3	SLAMS	PM2.5 - Local Conditions	Urban	Highest Concentration
PERKINSTOWN	55-119-8001-88101-3	SLAMS	PM2.5 - Local Conditions	Regional	General/Background
POTAWATOMI	55-041-0007-88101-3	TRIBAL	PM2.5 - Local Conditions	Regional	General/Background
POTOSI	55-043-0009-88101-3	SLAMS	PM2.5 - Local Conditions	Regional	Regional Transport
TROUT LAKE	55-125-0001-88101-3	SLAMS	PM2.5 - Local Conditions	Regional	General/Background
WAUKESHA - CLEVELAND AVE	55-133-0027-88101-2	SLAMS	PM2.5 - Local Conditions	Neighborhood	Quality Assurance
WAUKESHA - CLEVELAND AVE	55-133-0027-88101-3	SLAMS	PM2.5 - Local Conditions	Neighborhood	Highest Concentration

Table 5: Sampling Frequencies, Durations, Methods and Collocations of PM2.5 monitors

Site Name	AQS Monitor ID	Monitor Type	Method Code	Sample Analysis Description	Sample Duration	Collection Frequency	Collocation Primary Monitor Indicator	Distance from Primary Monitor
APPLETON - AAL	55-087-0009-88101-3	SLAMS	170	Beta Attenuation	1 hour	Every Day	P	n/a
BAD RIVER TRIBAL SCHOOL - ODANAH	55-003-0010-88101-1	TRIBAL	145	Gravimetric	24 hours	Every 6th Day	P	n/a
CHIWAUKEE PRAIRIE STATELINE	55-059-0019-88101-3	SLAMS	170	Beta Attenuation	1 hour	Every Day	P	n/a
DEVILS LAKE PARK	55-111-0007-88101-7	SLAMS	170	Beta Attenuation	1 hour	Every Day	P	n/a
DEVILS LAKE PARK	55-111-0007-88101-8	SLAMS	170	Beta Attenuation	1 hour	Every Day	C	2.3
EAU CLAIRE - DOT SIGN SHOP	55-035-0014-88101-3	SLAMS	170	Beta Attenuation	1 hour	Every Day	P	n/a
GREEN BAY EAST HIGH	55-009-0005-88101-3	SLAMS	170	Beta Attenuation	1 hour	Every Day	P	n/a
HARRINGTON BEACH PARK	55-089-0009-88101-3	SLAMS	170	Beta Attenuation	1 hour	Every Day	P	n/a
HORICON WILDLIFE AREA	55-027-0001-88101-1	SLAMS	145	Gravimetric	24 hours	Every 6th Day	n/a	2
HORICON WILDLIFE AREA	55-027-0001-88101-3	SLAMS	170	Beta Attenuation	1 hour	Every Day	P	n/a
LACROSSE - DOT BUILDING	55-063-0012-88101-3	SLAMS	170	Beta Attenuation	1 hour	Every Day	P	n/a
MADISON - UNIVERSITY AVE WELL #6	55-025-0047-88101-1	SLAMS	145	Gravimetric	24 hours	Every 6th Day	P	n/a
MADISON EAST	55-025-0041-88101-1	SLAMS	145	Gravimetric	24 hours	Every 6th Day	C	1
MADISON EAST	55-025-0041-88101-3	SLAMS	170	Beta Attenuation	1 hour	Every Day	P	n/a
MILWAUKEE - COLLEGE AVE. NR	55-079-0056-88101-3	SLAMS	170	Beta Attenuation	1 hour	Every Day	P	n/a
MILWAUKEE - COLLEGE AVE. PARK & RIDE	55-079-0058-88101-3	SLAMS	170	Beta Attenuation	1 hour	Every Day	P	n/a
MILWAUKEE - SER DNR HDQRS	55-079-0026-88101-1	SLAMS	145	Gravimetric	24 hours	Every 6th Day	P	n/a
MILWAUKEE - SER DNR HDQRS	55-079-0026-88101-2	SLAMS	145	Gravimetric	24 hours	Every 6th Day	C	4
MILWAUKEE - SER DNR HDQRS	55-079-0026-88101-3	SLAMS	170	Beta Attenuation	1 hour	Every Day	n/a	n/a
MILWAUKEE - SIXTEENTH ST. HEALTH CENTER	55-079-0010-88101-2	SLAMS	145	Gravimetric	24 hours	Every 3rd Day	C	4
MILWAUKEE - SIXTEENTH ST. HEALTH CENTER	55-079-0010-88101-3	SLAMS	170	Beta Attenuation	1 hour	Every Day	P	n/a
PERKINSTOWN	55-119-8001-88101-3	SLAMS	170	Beta Attenuation	1 hour	Every Day	P	n/a
POTAWATOMI	55-041-0007-88101-3	TRIBAL	170	Beta Attenuation	1 hour	Every Day	P	n/a
POTOSI	55-043-0009-88101-3	SLAMS	170	Beta Attenuation	1 hour	Every Day	P	n/a

Site Name	AQS Monitor ID	Monitor Type	Method Code	Sample Analysis Description	Sample Duration	Collection Frequency	Collocation Primary Monitor Indicator	Distance from Primary Monitor
TROUT LAKE	55-125-0001-88101-3	SLAMS	170	Beta Attenuation	1 hour	Every Day	P	n/a
WAUKESHA - CLEVELAND AVE	55-133-0027-88101-2	SLAMS	145	Gravimetric	24 hours	Every 6th Day	C	2
WAUKESHA - CLEVELAND AVE	55-133-0027-88101-3	SLAMS	170	Beta Attenuation	1 hour	Every Day	P	n/a

PM₁₀

PM₁₀ Monitoring Requirements

The minimum monitoring requirements for PM₁₀ are established in Appendix D of 40 CFR Part 58 and are summarized in Table 6. In addition to these population-based requirements, PM₁₀ monitoring is required at NCore sites. Currently, Wisconsin meets all PM₁₀ monitoring requirements (see Table 6). PM₁₀ values used in Table 7 were downloaded from AQS on April 3, 2018. Scales and objectives of DNR and tribal PM₁₀ monitors; and industrial monitors are summarized in Tables 8 and 9. Scales and objectives of monitors have been updated using current information. Finally, in Tables 10 and 11; sampling frequencies, durations, methods and collocations of DNR, tribal and industrial PM₁₀ monitors are summarized.

Currently, DNR's primary monitors consist of two beta attenuation Federal Equivalent Method (FEMs) monitors with a method code of 122 and five gravimetric Federal Reference Method (FRM) monitors with a method code of 141. Collocation requirements for PM₁₀ only apply to FRM monitors. At least 15% of the primary FRM monitors must be collocated. The collocated FRMs at Milwaukee College Ave. Park and Ride (55-079-0058)- meet this requirement.

Table 6: PM₁₀ Minimum Monitoring Requirements (number of stations per MSA)¹

Population Category	High Concentration²	Medium Concentration³	Low Concentration^{4,5}
>1 million	6-10	4-8	2-4
500,000 – 1 million	4-8	2-4	1-2
250,000 – 500,000	3-4	1-2	0-1
100,000 – 250,000	1-2	0-1	0

1 = Selection of urban areas and actual numbers of stations per area within the ranges shown in this table will be jointly determined by EPA and the State Agency.

2 = High concentration areas are those for which ambient PM₁₀ data show ambient concentrations exceeding the PM₁₀ NAAQS by 20 percent or more.

3 = Medium concentration areas are those for which ambient PM₁₀ data show ambient concentrations exceeding 80 percent of the PM₁₀ NAAQS.

4 = Low concentration areas are those for which ambient PM₁₀ data show ambient concentrations less than 80 percent of the PM₁₀ NAAQS.

5 = These minimum monitoring requirements apply in the absence of a design value.

Table 7: Wisconsin PM₁₀ Monitoring Requirements

Metropolitan Statistical Area	2017 Population Estimate	2015-2017 Days greater than 80% of the NAAQS (120 µg/m³)	Minimum Requirement	2019 Sites
Chicago-Naperville-Elgin, IL-IN-WI ¹	9,533,040	7	4-8	8
Minneapolis-St.Paul-Bloomington, MN-WI ²	3,600,618	17	6-10	8
Milwaukee-Waukesha-West Allis, WI ³	1,576,236	0	2-4	4
Madison, WI ⁴	654,230	0	1-2	1

Metropolitan Area	2017 Population Estimate	Expected days greater than 80% of the NAAQS (120 µg/m ³)	Minimum Requirement	2019 Sites
Green Bay, WI ⁵	320,050	-	0	0
Duluth, MN-WI ⁶	278,782	0	0	2
Appleton, WI ⁷	236,126	-	0	0
Racine, WI ⁸	167,484	-	0	0
Oshkosh-Neenah, WI ⁹	136,934	-	0	0
Eau Claire, WI ¹⁰	196,071	-	0	0
Janesville-Beloit, WI ¹¹	170,414	-	0	0
La Crosse-Onalaska, WI-MN ¹²	162,309	-	0	0
Wausau, WI ¹³	135,732	-	0	0
Sheboygan, WI ¹⁴	115,344	-	0	0
Fond du Lac, WI ¹⁵	102,548	-	0	0
NCore (Horicon)	Not a population based requirement		-	1

1 = Counties include: Cook (IL), DeKalb (IL), DuPage (IL), Grundy (IL), Jasper (IN), Kane (IL), Kendall (IL), Kenosha (WI), Lake (IL), Lake (IN), McHenry (IL), Newton (IN), Porter (IN) and Will (IL)

2 = Counties include: Anoka (MN), Carver (MN), Chisago (MN), Dakota (MN), Hennepin (MN), Isanti (MN), Ramsey (MN), Scott (MN), Sherburne (MN), Washington (MN), Wright (MN), Pierce (WI), St. Croix (WI)

3 = Counties include: Milwaukee (WI), Ozaukee (WI), Washington (WI) and Waukesha (WI)

4 = Counties include: Columbia (WI), Dane (WI), Green (WI) and Iowa (WI)

5 = Counties include: Brown (WI), Kewaunee (WI) and Oconto (WI)

6 = Counties include: Carlton (MN), St. Louis (MN), Douglas (WI)

7 = Counties include: Outagamie (WI)

8 = Counties include: Racine (WI)

9 = Counties include: Winnebago (WI)

10 = Counties include: Chippewa (WI) and Eau Claire (WI)

11 = Counties include: Rock (WI)

12 = Counties include: Houston (MN) and La Crosse (WI)

13 = Counties include: Marathon (WI)

14 = Counties include: Sheboygan (WI)

15 = Counties include: Fond du Lac (WI)

16 = This calculation excludes PM₁₀ monitoring results from an industrial area of North Minneapolis (27-053-0909 and 27-053-0910)

Table 8: Scales and Objectives of DNR PM₁₀ Monitors

Site Name	AQS Monitor ID	Monitor Type	Parameter Description	Measurement Scale	Monitor Objective Type
DEVILS LAKE PARK	55-111-0007-81101-7	SLAMS	PM10 Total 0-10um Stp	Regional Scale	General/Background
DEVILS LAKE PARK	55-111-0007-81101-8	SLAMS	PM10 Total 0-10um Stp	Regional Scale	Quality Assurance
HORICON WILDLIFE AREA	55-027-0001-81102-1	SLAMS	PM10 Total 0-10um Stp	Regional Scale	General/Background
HORICON WILDLIFE AREA	55-027-0001-81102-2	SLAMS	PM10 Total 0-10um Stp	Regional Scale	Quality Assurance
HORICON WILDLIFE AREA	55-027-0001-81102-3	SLAMS	PM10 Total 0-10um Stp	Regional Scale	General/Background
MADISON - UNIVERSITY AVE WELL #6	55-025-0047-81102-1	SLAMS	PM10 Total 0-10um Stp	Neighborhood	Population Exposure
MILWAUKEE - COLLEGE AVE. PARK & RIDE	55-079-0058-81102-1	SLAMS	PM10 Total 0-10um Stp	Neighborhood	Population Exposure
MILWAUKEE - COLLEGE AVE. PARK & RIDE	55-079-0058-81102-2	SLAMS	PM10 Total 0-10um Stp	Neighborhood	Quality Assurance
MILWAUKEE - SER DNR HDQRS	55-079-0026-81102-3	SLAMS	PM10 Total 0-10um Stp	Neighborhood	Population Exposure
MILWAUKEE - SIXTEENTH ST. HEALTH CENTER	55-079-0010-81102-1	SLAMS	PM10 Total 0-10um Stp	Neighborhood	Population Exposure
WAUKESHA - CLEVELAND AVE	55-133-0027-81102-1	SLAMS	PM10 Total 0-10um Stp	Middle Scale	Highest Concentration

Table 9: Scales and Objectives of Industrial PM₁₀ Monitors

Site Name	AQS Monitor ID	Monitor Type	Parameter Description	Measurement Scale	Monitor Objective Type
Chieftain Sand	55-005-1004-81102-1	Industrial	PM10 Total 0-10um Stp	Middle Scale	Source Oriented
Great Northern Sand	55-005-1002-81102-1	Industrial	PM10 Total 0-10um Stp	Middle Scale	Source Oriented
Hi-Crush – Blair	55-121-1004-81102-1	Industrial	PM10 Total 0-10um Stp	Middle Scale	Source Oriented
Hi-Crush – Whitehall	55-121-1002-81102-1	Industrial	PM10 Total 0-10um Stp	Middle Scale	Source Oriented
Sand Products – Blair	55-121-1003-81102-1	Industrial	PM10 Total 0-10um Stp	Middle Scale	Source Oriented
Smart Sands – Hixton	55-053-1002-81102-1	Industrial	PM10 Total 0-10um Stp	Middle Scale	Source Oriented
Smart Sands – Oakdale	55-081-1001-81102-1	Industrial	PM10 Total 0-10um Stp	Middle Scale	Source Oriented
Superior Silica Sands – Arland	55-005-1006-81102-1	Industrial	PM10 Total 0-10um Stp	Middle Scale	Source Oriented
Superior Silica Sands – Barron Plant	55-005-1003-81102-1	Industrial	Pm10 Total 0-10um Stp	Middle Scale	Source Oriented
Superior Silica Sands - New Auburn	55-005-1001-81102-1	Industrial	Pm10 Total 0-10um Stp	Middle Scale	Source Oriented
Superior Silica Sands – Thompson Hills	55-005-1005-81102-1	Industrial	Pm10 Total 0-10um Stp	Middle Scale	Source Oriented

Site Name	AQS Monitor ID	Monitor Type	Parameter Description	Measurement Scale	Monitor Objective Type
Unimin - Basin Site #3	55-081-1005-81102-1	Industrial	Pm10 Total 0-10um Stp	Middle Scale	Source Oriented
Unimin - Curran Site #1	55-081-1003-81102-1	Industrial	Pm10 Total 0-10um Stp	Middle Scale	Source Oriented
Unimin - Rouse Site #2	55-081-1004-81102-1	Industrial	Pm10 Total 0-10um Stp	Middle Scale	Source Oriented
Wisconsin Proppants – Alma #1	55-053-1004-81102-1	Industrial	Pm10 Total 0-10um Stp	Middle Scale	Source Oriented
Wisconsin Proppants – Alma #2	55-019-1001-81102-1	Industrial	Pm10 Total 0-10um Stp	Middle Scale	Source Oriented
Wisconsin Proppants - Hixton	55-053-1003-81102-1	Industrial	Pm10 Total 0-10um Stp	Middle Scale	Source Oriented

Table 10: Sampling Frequencies, Durations, Methods and Collocations of DNR PM₁₀ Monitors

Site Name	AQS Monitor ID	Monitor Type	Method Code	Sample Analysis Description	Sample Duration	Collection Frequency	Collocation Primary Monitor Indicator	Distance from Primary Monitor
DEVILS LAKE PARK	55-111-0007-81102-7	SLAMS	122	Beta Attenuation	1 hour	Every Day	P	n/a
DEVILS LAKE PARK	55-111-0007-81102-8	SLAMS	122	Beta Attenuation	1 hour	Every Day	C	2.3
HORICON WILDLIFE AREA	55-027-0001-81102-1	SLAMS	141	Gravimetric	24 hours	Every 6 th Day	P	n/a
HORICON WILDLIFE AREA	55-027-0001-81102-2	SLAMS	141	Gravimetric	24 hours	Monthly	C	3.0
HORICON WILDLIFE AREA	55-027-0001-81102-3	SLAMS	122	Beta Attenuation	1 hour	Every Day	n/a	n/a
MADISON - UNIVERSITY AVE WELL #6	55-025-0047-81102-1	SLAMS	141	Gravimetric	24 hours	Every 6 th Day	P	n/a
MILWAUKEE - COLLEGE AVE. PARK & RIDE	55-079-0058-81102-1	SLAMS	141	Gravimetric	24 hours	Every 6 th Day	P	n/a
MILWAUKEE - COLLEGE AVE. PARK & RIDE	55-079-0058-81102-2	SLAMS	141	Gravimetric	24 hours	Every 6 th Day	C	3.8
MILWAUKEE - SER DNR HDQRS	55-079-0026-81102-3	SLAMS	122	Beta Attenuation	1 hour	Every Day	P	n/a
MILWAUKEE - SIXTEENTH ST. HEALTH CENTER	55-079-0010-81102-1	SLAMS	141	Gravimetric	24 hours	Every 12 th Day	P	n/a
WAUKESHA - CLEVELAND AVE	55-133-0027-81102-1	SLAMS	141	Gravimetric	24 hours	Every 6 th Day	P	n/a

Table 11: Sampling Frequencies, Durations, Methods and Collocations of Industrial PM₁₀ Monitors

Site Name	AQS Monitor ID	Monitor Type	Method Code	Sample Analysis Description	Sample Duration	Collection Frequency	Collocation Primary Monitor Indicator	Distance from Primary Monitor
Chieftain Sand	55-005-1004-81102-1	Industrial	141	Gravimetric	24 hours	Every 6th Day	P	n/a
Great Northern Sand	55-005-1002-81102-1	Industrial	141	Gravimetric	24 hours	Every 6th Day	P	n/a
Hi-Crush – Blair	55-121-1004-81102-1	Industrial	141	Gravimetric	24 hours	Every 6th Day	P	n/a
Hi-Crush – Whitehall	55-121-1002-81102-1	Industrial	141	Gravimetric	24 hours	Every 6th Day	P	n/a
Sand Products – Blair	55-121-1003-81102-1	Industrial	216	Gravimetric	24 hours	Every 6th Day	P	n/a
Smart Sands – Hixton	55-053-1002-81102-1	Industrial	141	Gravimetric	24 hours	Every 6th Day	P	n/a
Smart Sands – Oakdale	55-081-1001-81102-1	Industrial	141	Gravimetric	24 hours	Every 6th Day	P	n/a
Superior Silica Sands – Arland	55-005-1006-81102-1	Industrial	141	Gravimetric	24 hours	Every 6th Day	P	n/a
Superior Silica Sands – Barron Plant	55-005-1003-81102-1	Industrial	141	Gravimetric	24 hours	Every 6th Day	P	n/a
Superior Silica Sands - New Auburn	55-005-1001-81102-1	Industrial	141	Gravimetric	24 hours	Every 6th Day	P	n/a
Superior Silica Sands – Thompson	55-005-1005-81102-1	Industrial	141	Gravimetric	24 hours	Every 6th Day	P	n/a
Unimin - Basin Site #3	55-081-1005-81102-1	Industrial	197	Gravimetric	24 hours	Every 6th Day	P	n/a
Unimin - Curran Site #1	55-081-1003-81102-1	Industrial	197	Gravimetric	24 hours	Every 6th Day	P	n/a
Unimin - Rouse Site #2	55-081-1004-81102-1	Industrial	197	Gravimetric	24 hours	Every 6th Day	P	n/a
Wisconsin Proppants – Alma #1	55-053-1004-81102-1	Industrial	141	Gravimetric	24 hours	Every 6th Day	P	n/a
Wisconsin Proppants – Alma #2	55-019-1001-81102-1	Industrial	141	Gravimetric	24 hours	Every 6th Day	P	n/a
Wisconsin Proppants - Hixton	55-053-1003-81102-1	Industrial	141	Gravimetric	24 hours	Every 6th Day	P	n/a

TSP

TSP Monitoring Requirements

TSP was one of the original NAAQS; however, it was replaced in 1987 by the PM₁₀ standard at the national level. In Tables 12 and 13; sampling frequencies, durations, methods and collocations of DNR, tribal and industrial PM₁₀ monitors are summarized. Currently, there are no federal requirements to monitor TSP. There is one DNR site located in Kohler that measures lead as well and one TSP industrial site located in Waukesha which is the reason for TSP's inclusion in this appendix.

Table 12: Scales and Objectives of DNR and Industrial TSP Monitors

Site Name	AQS Monitor ID	Monitor Type	Parameter Description	Measurement Scale	Monitor Objective Type
KOHLER CO-METALS PROCESSING COMPLEX	55-117-0008-11101-1	Industrial	Total Suspended Particulate	Middle Scale	Source Oriented
KOHLER CO-METALS PROCESSING COMPLEX	55-117-0008-11101-2	Industrial	Total Suspended Particulate	Middle Scale	Quality Assurance
METALTEK INTERNATIONAL WISCONSIN CENTRIFUGAL	55-133-0039-11101-1	Industrial	Total Suspended Particulate	Middle Scale	Source Oriented

Table 13: Sampling Frequencies, Durations, Methods and Collocations of DNR TSP Monitors

Site Name	AQS Monitor ID	Monitor Type	Method Code	Sample Analysis Description	Sample Duration	Collection Frequency	Collocation Primary Monitor Indicator	Distance from Primary Monitor
KOHLER CO-METALS PROCESSING COMPLEX	55-117-0008-11101-1	Industrial	091	ICAP SPECTRA	24 hours	Every 6th Day	P	n/a
KOHLER CO-METALS PROCESSING COMPLEX	55-117-0008-11101-2	Industrial	091	ICAP SPECTRA	24 hours	Every 12th Day	C	2.4
METALTEK INTERNATIONAL WISCONSIN	55-133-0039-11101-1	Industrial	091	Gravimetric	24 hours	Every 6th Day	P	n/a

Lead

Lead Monitoring Requirements

The minimum monitoring requirements for lead are established in Appendix D of 40 CFR Part 58. The lead monitoring requirements are based on annual lead emissions. This source-oriented network requires lead monitoring for non-airport sources which emit 0.5 tons per year and for each airport which emits 1.0 or more tons per year based on either the most recent National Emission Inventory or other scientifically justifiable methods and data.

Table 14 identifies Wisconsin facilities with lead emissions greater than 0.5 TPY based on the 2016 Wisconsin Air Emission Inventory. Scales, objectives, sampling frequencies, durations, methods and collocations of lead monitors are summarized in Tables 15 and 16.

Table 14: Sources with 2016 Annual Lead Emissions greater than 0.5 TPY

Facility Name	City	County	2017 Lead Emissions (TPY)
KOHLER CO-METALS PROCESSING COMPLEX	Kohler	Sheboygan	0.52

Table 15: Scales and Objectives of Industrial TSP Monitors

Site Name	AQS Monitor ID	Monitor Type	Parameter Description	Measurement Scale	Monitor Objective Type
KOHLER CO-METALS PROCESSING COMPLEX	55-117-0008-14129-1	Industrial	Lead (TSP) LC	Middle Scale	Source Oriented
KOHLER CO-METALS PROCESSING COMPLEX	55-117-0008-14129-2	Industrial	Lead (TSP) LC	Middle Scale	Quality Assurance

Table 16: Sampling Frequencies, Durations, Methods and Collocations of Industrial TSP Monitors

Site Name	AQS Monitor ID	Monitor Type	Method Code	Sample Analysis Description	Sample Duration	Collection Frequency	Collocation Primary Monitor Indicator	Distance from Primary Monitor
KOHLER CO-METALS PROCESSING COMPLEX	55-117-0008-14129-1	Industrial	109	ICAP SPECTRA	24 hours	Every 6th Day	Y	n/a
KOHLER CO-METALS PROCESSING COMPLEX	55-117-0008-14129-2	Industrial	109	ICAP SPECTRA	24 hours	Every 12th Day	N	2.4

Ozone

Ozone Monitoring Requirements

The minimum monitoring requirements for ozone are established in Section 4.1 of Appendix D of 40 CFR part 58 and are summarized in Table 17. In addition to these population-based requirements, ozone monitoring is required at NCore sites. Wisconsin currently meets all ozone monitoring requirements (see Table 17). Design values (DVs) used in Table 18 are the preliminary valid 2017 DVs. Scales, objectives, seasons and methods of ozone monitors are summarized in Tables 19 and 20. Scales and objectives of monitors have been updated using current information. All ozone monitors are continuously collecting hourly observations.

Table 17: Ozone Minimum Monitoring Requirements

MSA Population ^{1,2}	Most recent 3-year design value concentrations \geq 85% of any O ₃ NAAQS ³	Most recent 3-year design value concentration < 85% of any O ₃ NAAQS ^{3,4}
>10 million	4	2
4-10 million	3	1
350,000 - <4 million	2	1
50,000 - <350,000	1	0

1 = Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).

2 = Population based on latest available census figures.

3 = The ozone (O₃) National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR part 50.

4 = These minimum monitoring requirements apply in the absence of a design value.

5 = Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

Table 18: Wisconsin Ozone Monitoring Requirements

Metropolitan Statistical Area	2017 Population Estimate	Maximum 2017 8- Hour DV as % of Standard (70 ppb)	Minimum Requirement	2019 Sites
Chicago-Naperville-Elgin, IL-IN-WI ¹	9,533,040	111	3	21
Minneapolis-St.Paul-Bloomington, MN-WI ²	3,600,618	89	3	6
Milwaukee-Waukesha-West Allis, WI ³	1,576,236	104	2	6
Madison, WI ⁴	654,230	93	2	2
Green Bay, WI ⁵	320,050	99	1	2
Duluth, MN-WI ⁶	278,782	84	0	3
Appleton, WI ⁷	236,126	93	1	1
Racine, WI ⁸	167,484	106	1	1
Oshkosh-Neenah, WI ⁹	9,533,040	insufficient data for DV	0	0
Eau Claire, WI ¹⁰	3,600,618	87	1	1

Metropolitan Statistical Area	2017 Population Estimate	Maximum 2017 8- Hour DV as % of Standard (70 ppb)	Minimum Requirement	2019 Sites
Janesville-Beloit, WI ¹¹	162,309	94	1	1
La Crosse-Onalaska, WI-MN ¹²	135,732	89	1	1
Wausau, WI ¹³	115,344	90	1	1
Sheboygan, WI ¹⁴	102,548	114	1	1
Fond du Lac, WI ¹⁵	162,309	91	1	1
NCore (Horicon)	Not a population based		1	1

1 = Counties include: Cook (IL), DeKalb (IL), DuPage (IL), Grundy (IL), Jasper (IN), Kane (IL), Kendall (IL), Kenosha (WI), Lake (IL), Lake (IN), McHenry (IL), Newton (IN), Porter (IN) and Will (IL)

2 = Counties include: Anoka (MN), Carver (MN), Chisago (MN), Dakota (MN), Hennepin (MN), Isanti (MN), Ramsey (MN), Scott (MN), Sherburne (MN), Washington (MN), Wright (MN), Pierce (WI), St. Croix (WI)

3 = Counties include: Milwaukee (WI), Ozaukee (WI), Washington (WI) and Waukesha (WI)

4 = Counties include: Columbia (WI), Dane (WI), Green (WI) and Iowa (WI)

5 = Counties include: Brown (WI), Kewaunee (WI) and Oconto (WI)

6 = Counties include: Carlton (MN), St. Louis (MN), Douglas (WI)

7 = Counties include: Outagamie (WI)

8 = Counties include: Racine (WI)

9 = Counties include: Winnebago (WI)

10 = Counties include: Chippewa (WI) and Eau Claire (WI)

11 = Counties include: Rock (WI)

12 = Counties include: Houston (MN) and La Crosse (WI)

13 = Counties include: Marathon (WI)

14 = Counties include: Sheboygan (WI)

15 = Counties include: Fond du Lac (WI)

Table 19: Scales and Objectives of Ozone Monitors

Site Name	AQS Monitor ID	Monitor Type	Parameter Description	Measurement Scale	Monitor Objective Type
APPLETON - AAL	55-087-0009-44201-1	SLAMS	Ozone	Urban	Max Ozone Concentration
BAD RIVER TRIBAL SCHOOL - ODANAH	55-003-0010-44201-1	TRIBAL	Ozone	Regional	General/Background
BAYSIDE	55-079-0085-44201-1	SLAMS	Ozone	Neighborhood	Population Exposure
BELOIT - CONVERSE	55-105-0030-44201-1	SLAMS	Ozone	Urban	Regional Transport and Max Ozone Concentration
CHIWAUKEE PRAIRIE STATELINE	55-059-0019-44201-1	SLAMS	Ozone	Neighborhood	Regional Transport and Max Ozone Concentration
COLUMBUS	55-021-0015-44201-1	SLAMS	Ozone	Regional	Max Ozone Concentration
DEVILS LAKE PARK	55-111-0007-44201-1	SLAMS	Ozone	Regional	General / Background
EAU CLAIRE - DOT SIGN SHOP	55-035-0014-44201-1	SLAMS	Ozone	Urban	Max Ozone Concentration
FOND DU LAC	55-039-0006-44201-1	SLAMS	Ozone	Regional	Max Ozone Concentration
GRAFTON	55-089-0008-44201-1	SLAMS	Ozone	Neighborhood	Regional Transport
GREEN BAY - UW	55-009-0026-44201-1	SLAMS	Ozone	Urban	Population Exposure
HARRINGTON BEACH PARK	55-089-0009-44201-1	SLAMS	Ozone	Urban	Max Ozone Concentration
HORICON WILDLIFE AREA	55-027-0001-44201-2	SLAMS	Ozone	Regional	General/Background
JEFFERSON – LAATSCH	55-055-0009-44201-1	SLAMS	Ozone	Regional	Regional Transport and General/Background
KENOSHA - WATER TOWER	55-059-0025-44201-1	SPM	Ozone	Neighborhood	Population Exposure
KEWAUNEE	55-061-0002-44201-1	SLAMS	Ozone	Neighborhood	Regional Transport and Max Ozone Concentration
LACROSSE - DOT BUILDING	55-063-0012-44201-1	SLAMS	Ozone	Regional	Max Ozone Concentration
LAKE DUBAY	55-073-0012-44201-1	SLAMS	Ozone	Regional	General/Background
LAKE GENEVA	55-127-0005-44201-1	SLAMS	Ozone	Regional	Regional Transport
MADISON EAST	55-025-0041-44201-1	SLAMS	Ozone	Urban	Population Exposure
MANITOWOC - WDLND DUNES	55-071-0007-44201-1	SLAMS	Ozone	Neighborhood	Regional Transport
MILWAUKEE - SER DNR HDQRS	55-079-0026-44201-1	SLAMS	Ozone	Neighborhood	Population Exposure
MILWAUKEE - SIXTEENTH ST. HEALTH CENTER	55-079-0010-44201-2	SLAMS	Ozone	Neighborhood	Population Exposure
NEWPORT PARK	55-029-0004-44201-1	SLAMS	Ozone	Neighborhood	Regional Transport
POTAWATOMI	55-041-0007-44201-1	TRIBAL	Ozone	Regional	General/Background
RACINE – PAYNE AND DOLAN	55-101-0020-44201-1	SLAMS	Ozone	Neighborhood	Regional Transport and Max Ozone Concentration
SHEBOYGAN - HAVEN	55-117-0009-44201-1	SPM	Ozone	Neighborhood	Population Exposure

Site Name	AQS Monitor ID	Monitor	Parameter	Measurement Scale	Monitor Objective Type
TROUT LAKE	55-125-0001-44201-1	SLAMS	Ozone	Regional	General/Background
WAUKESHA - CLEVELAND AVE	55-133-0027-44201-1	SLAMS	Ozone	Urban	Population Exposure

Table 20: Methods and Seasons of Ozone Monitors

Site Name	AQS Monitor ID	Monitor Type	Method Code	Sample Analysis Description	Season
APPLETON - AAL	55-087-0009-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
APPLETON – AAL	55-087-0009-88101-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
BAD RIVER TRIBAL SCHOOL - ODANAH	55-003-0010-44201-1	TRIBAL	087	Ultra Violet Absorption	Year Round
BAYSIDE	55-079-0085-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
BELOIT - CONVERSE	55-105-0030-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
CHIWAUKEE PRAIRIE STATELINE	55-059-0019-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 31
COLUMBUS	55-021-0015-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
DEVILS LAKE PARK	55-111-0007-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
EAU CLAIRE - DOT SIGN SHOP	55-035-0014-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
FOND DU LAC	55-039-0006-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
GRAFTON	55-089-0008-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
GREEN BAY - UW	55-009-0026-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
HARRINGTON BEACH PARK	55-089-0009-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
HORICON WILDLIFE AREA	55-027-0001-44201-2	SLAMS	087	Ultra Violet Absorption	Year Round
JEFFERSON - LAATSCH	55-055-0009-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
KENOSHA - WATER TOWER	55-059-0025-44201-1	SPM	087	Ultra Violet Absorption	Mar 1 – Oct 31
KEWAUNEE	55-061-0002-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
LACROSSE - DOT BUILDING	55-063-0012-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
LAKE DUBAY	55-073-0012-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
LAKE GENEVA	55-127-0005-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
MADISON EAST	55-025-0041-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
MANITOWOC - WDLND DUNES	55-071-0007-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
MILWAUKEE - SER DNR HDQRS	55-079-0026-44201-1	SLAMS	087	Ultra Violet Absorption	Year Round
MILWAUKEE - SIXTEENTH ST. HEALTH CENTER	55-079-0010-44201-2	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
NEWPORT PARK	55-029-0004-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
POTAWATOMI	55-041-0007-44201-1	TRIBAL	087	Ultra Violet Absorption	Year Round
RACINE - PAYNE AND DOLAN	55-101-0020-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15

Site Name	AQS Monitor ID	Monitor Type	Method Code	Sample Analysis Description	Season
SHEBOYGAN - HAVEN	55-117-0009-44201-1	SPM	087	Ultra Violet Absorption	Mar 1 – Oct 15
TROUT LAKE	55-125-0001-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15
WAUKESHA - CLEVELAND AVE	55-133-0027-44201-1	SLAMS	087	Ultra Violet Absorption	Mar 1 – Oct 15

Carbon Monoxide

Carbon Monoxide Monitoring Requirements

The minimum monitoring requirements for carbon monoxide (CO) are established in Appendix D of 40 CFR Part 58. These requirements include CO monitoring at NCore sites and at a near-road air monitoring site in CBSAs having a population of 1,000,000 or more persons. In addition to these minimum requirements, the Regional Administrator may require additional monitors in situations where data or other information suggests that CO concentrations may be approaching or exceeding the NAAQS. Wisconsin currently meets the minimum CO monitoring requirements (see Table 21). All CO monitors are continuous collecting hourly observations. Scales, objectives and methods of CO monitors are summarized in Tables 22 and 23.

Table 21: Wisconsin Carbon Monoxide Monitoring Requirements

Requirement	Required Sites	2019 Sites
NCore (Horicon)	1	1
Near-road CO for CBSAs > 1 million (Milwaukee-Waukesha-West Allis, WI)	1	1

Table 22: Scales and Objectives of Carbon Monoxide Monitors

Site Name	AQS Monitor ID	Monitor Type	Parameter Description	Measurement Scale	Monitor Objective Type
HORICON WILDLIFE AREA	55-027-0001-42101-1	SLAMS	Carbon Monoxide	Regional	General/Background
MILWAUKEE - COLLEGE AVE. NR	55-079-0056-42101-1	SLAMS	Carbon Monoxide	Neighborhood	Max Precursor Emissions Impact

Table 23: Methods of Carbon Monoxide Monitors

Site Name	AQS Monitor ID	Monitor Type	Method Code	Sample Analysis Description
HORICON WILDLIFE AREA	55-027-0001-42101-1	SLAMS	593	Gas Filter Correlation
MILWAUKEE - COLLEGE AVE. NR	55-079-0056-42101-1	SLAMS	593	Gas Filter Correlation

Nitrogen Dioxide

Nitrogen Dioxide Monitoring Requirements

The minimum monitoring requirements for nitrogen dioxide (NO₂) are established in Appendix D of 40 CFR Part 58. There are two primary monitoring objectives for NO₂ including monitoring near roads and in neighborhoods (area-wide). Table 24 summarizes the minimum monitoring requirements for NO₂. In addition to these minimum requirements, the Regional Administrator may require additional monitoring in areas where NO₂ is expected to be near the level of the NAAQS. Currently, Wisconsin meets all NO₂ monitoring requirements (Table 25). Scales, objectives and methods of NO₂ monitors are summarized in Tables 26 and 27. Scales and objectives of monitors have been updated using current information.

Table 24: Nitrogen Dioxide Minimum Monitoring Requirements

MSA Population	Near-Road Monitors	Area-Wide Monitors
> 1,000,000	1	1
> 2,500,000	2	1

Table 25: Wisconsin Nitrogen Dioxide Monitoring Requirements

Metropolitan Statistical Area	2017 Population Estimate	Required Near- Road	2018 Near- Road	Required Area- Wide	2019 Area-Wide
Chicago-Naperville-Elgin, IL-IN-WI ¹	9,533,040	2	2	1	2
Minneapolis-St. Paul-Bloomington, MN-WI ²	3,600,618	2	2	1	3
Milwaukee-Waukesha-West Allis, WI ³	1,576,236	1	1	1	1

1 = Counties include: Cook (IL), DeKalb (IL), DuPage (IL), Grundy (IL), Jasper (IN), Kane (IL), Kendall (IL), Kenosha (WI), Lake (IL), Lake (IN), McHenry (IL), Newton (IN), Porter (IN) and Will (IL)

2 = Counties include: Anoka (MN), Carver (MN), Chisago (MN), Dakota (MN), Hennepin (MN), Isanti (MN), Ramsey (MN), Scott (MN), Sherburne (MN), Washington (MN), Wright (MN), Pierce (WI), St. Croix (WI)

3 = Counties include: Milwaukee (WI), Ozaukee (WI), Washington (WI) and Waukesha (WI)

Table 26: Scales and Objectives of Nitrogen Dioxide Monitors

Site Name	AQS Monitor ID	Monitor Type	Parameter Description	Measurement Scale	Monitor Objective Type
MANITOWOC - WDLND DUNES	55-071-0007-42602-1	SLAMS	Nitrogen Dioxide (NO ₂)	Regional	Regional Transport
MILWAUKEE - COLLEGE AVE. NR	55-079-0056-42602-1	SLAMS	Nitrogen Dioxide (NO ₂)	Microscale	Highest Concentration
MILWAUKEE - SER DNR HDQRS	55-079-0026-42602-1	SLAMS	Nitrogen Dioxide (NO ₂)	Neighborhood	Population Exposure

Table 27: Methods of DNR Nitrogen Dioxide Monitors

Site Name	AQS Monitor ID	Monitor Type	Method Code	Sample Analysis Description
MANITOWOC - WDLND DUNES	55-071-0007-42602-1	SLAMS	099	Gas Phase Chemiluminescence
MILWAUKEE - COLLEGE AVE. NR	55-079-0056-42602-1	SLAMS	212	Cavity Attenuation Phase Shift
MILWAUKEE - SER DNR HDQRS	55-079-0026-42602-1	SLAMS	099	Gas Phase Chemiluminescence

Sulfur Dioxide

Sulfur Dioxide Monitoring Requirements

The minimum monitoring requirements for SO₂ are established in Appendix D of 40 CFR Part 58. The SO₂ monitoring requirement is based on the Population Weighted Emissions Index (PWEI) for all Core Based Statistical Areas (CBSAs). The PWEI is calculated by multiplying the population of each CBSA, using the most recent census data or estimates, and the total amount of SO₂ in tons per year emitted within the CBSA area, using an aggregate of the most recent county level emissions data available in the National Emissions Inventory (NEI) for each county in each CBSA. The resulting value is divided by one million providing a PWEI value. The units are million person-tons per year. The minimum monitoring requirements based on PWEI are summarized in Tables 28 and 29. For NCore sites, SO₂ monitoring is required independent of population-based requirements.

Table 28: Sulfur Dioxide Minimum Monitoring Requirements

PWEI	Required Sites
≥1 million	3
100,000 to < 1 million	2
5,000 to < 100,000	1

Table 29: Wisconsin Sulfur Dioxide Monitoring Requirements

Core Based Statistical Area	2017 Population Estimate	2014 NEI SO ₂ (tons/year)	PWEI	Minimum Requirement	2019 Sites
Chicago-Naperville-Elgin, IL-IN-WI ¹	9,533,040	80,686	769,183	2	5
Minneapolis-St. Paul-Bloomington, MN-WI ²	3,600,618	22,839	83,235	1	2
Milwaukee-Waukesha-West Allis, WI ³	1,576,236	5,204	8,203	1	1
Madison, WI ⁴	654,230	8,355	5,466	1	1
Green Bay, WI ⁵	320,050	15,206	4,867	0	1
Duluth, MN-WI ⁶	278,782	6,867	1,914	0	0
Appleton, WI ⁷	236,126	8,052	1,901	0	0
Racine, WI ⁸	167,484	244	41	0	0
Oshkosh-Neenah, WI ⁹	136,934	238	33	0	0
Eau Claire, WI ¹⁰	196,071	250	49	0	0
Janesville-Beloit, WI ¹¹	170,414	120	20	0	0
La Crosse-Onalaska, WI-MN ¹²	162,309	153	25	0	0
Wausau, WI ¹³	135,732	7,096	963	0	0
Sheboygan, WI ¹⁴	115,344	10,720	1,236	0	0
Fond du Lac, WI ¹⁵	102,548	163	17	0	0
NCore (Horicon)	Not a population based requirement			1	1

1 = Counties include: Cook (IL), DeKalb (IL), DuPage (IL), Grundy (IL), Jasper (IN), Kane (IL), Kendall (IL), Kenosha (WI), Lake (IL), Lake (IN), McHenry (IL), Newton (IN), Porter (IN) and Will (IL)

2 = Counties include: Anoka (MN), Carver (MN), Chisago (MN), Dakota (MN), Hennepin (MN), Isanti (MN), Ramsey (MN), Scott (MN), Sherburne (MN), Washington (MN), Wright (MN), Pierce (WI), St. Croix (WI)

3 = Counties include: Milwaukee (WI), Ozaukee (WI), Washington (WI) and Waukesha (WI)

- 4 = Counties include: Columbia (WI), Dane (WI), Green (WI) and Iowa (WI)
- 5 = Counties include: Brown (WI), Kewaunee (WI) and Oconto (WI)
- 6 = Counties include: Carlton (MN), St. Louis (MN), Douglas (WI)
- 7 = Counties include: Outagamie (WI)
- 8 = Counties include: Racine (WI)
- 9 = Counties include: Winnebago (WI)
- 10 = Counties include: Chippewa (WI) and Eau Claire (WI)
- 11 = Counties include: Rock (WI)
- 12 = Counties include: Houston (MN) and La Crosse (WI)
- 13 = Counties include: Marathon (WI)
- 14 = Counties include: Sheboygan (WI)
- 15 = Counties include: Fond du Lac (WI)

In addition to the minimum monitoring requirements above, on August 21, 2015, EPA published its final Data Requirements Rule (DRR) for the 2010 1-hour SO₂ NAAQS (80 Fed. Reg. 51052). This rule directed states to provide data to EPA to characterize current air quality in areas with large sources of SO₂ emissions to identify maximum 1-hour SO₂ concentrations in ambient air. The DRR required states to indicate the approach they will use for each listed source to characterize air quality in the respective area: air quality characterization through air quality modeling or ambient monitoring, or establishment of a federally enforceable emission limit (or facility shutdown).

As required by the DRR, on July 1, 2016, DNR identified to EPA the approach it intended to use to characterize the air quality in each of the eight areas identified in Wisconsin under the DRR. On that date, DNR notified EPA that the department would be characterizing the air quality around one source (the Expera-Kaukauna facility) using ambient monitoring. Based on modeling conducted in accordance with EPA's SO₂ NAAQS Monitoring Technical Assistance Document, and in consultation with EPA, a monitor site was selected to meet this requirement. EPA concurred with this siting recommendation on October 19, 2016. As required by the DRR, this monitor was installed and operating by January 1, 2017. The EXPERA – KAUKAUNA site is operated by the facility.

There are three source based sites (i.e. EXPERA – KAUKAUNA, GREEN BAY EAST HIGH and RHINELANDER TOWER), three non-source base sites (i.e. MADISON EAST, MILWAUKEE - SER DNR HDQRS and POTAWATOMI) and one NCore site (i.e. HORICON WILDLIFE AREA). Scales, objectives and methods of SO₂ monitors are summarized in Tables 30 and 31. Scales and objectives of monitors have been updated using current information.

Table 30: Scales and Objectives of DNR and Industrial Sulfur Dioxide Monitors

Site Name	AQS Monitor ID	Monitor Type	Parameter Description	Measurement Scale	Monitor Objective Type
EXPERA – KAUKAUNA	55-087-0015-42401-1	Industrial	Sulfur Dioxide (SO ₂)	Neighborhood	Highest Concentration and Source Oriented
GREEN BAY EAST HIGH	55-009-0005-42401-1	SLAMS	Sulfur Dioxide (SO ₂)	Neighborhood	Population Exposure
HORICON WILDLIFE AREA	55-027-0001-42401-1	SLAMS	Sulfur Dioxide (SO ₂)	Urban	General/Background
MADISON EAST	55-025-0041-42401-1	SLAMS	Sulfur Dioxide (SO ₂)	Neighborhood	Population Exposure
MILWAUKEE - SER DNR HDQRS	55-079-0026-42401-1	SLAMS	Sulfur Dioxide (SO ₂)	Neighborhood	Population Exposure
POTAWATOMI	55-041-0007-42401-1	TRIBAL	Sulfur Dioxide (SO ₂)	Urban	General/Background
RHINELANDER TOWER	55-085-0996-42401-1	SLAMS	Sulfur Dioxide (SO ₂)	Neighborhood	Highest Concentration and Source Oriented

Table 31: Methods of DNR and Industrial Sulfur Dioxide Monitors

Site Name	AQS Monitor ID	Monitor Type	Method Code	Sample Analysis Description
EXPERA - KAUKAUNA	55-087-0015-42401-1	Industrial	060	Pulsed Fluorescence
GREEN BAY EAST HIGH	55-009-0005-42401-1	SLAMS	100	Ultraviolet Fluorescence
HORICON WILDLIFE AREA	55-027-0001-42401-1	SLAMS	600	Ultraviolet Fluorescence API 100EU
MADISON EAST	55-025-0041-42401-1	SLAMS	100	Ultraviolet Fluorescence
MILWAUKEE - SER DNR HDQRS	55-079-0026-42401-1	SLAMS	100	Ultraviolet Fluorescence
POTAWATOMI	55-041-0007-42401-1	TRIBAL	100	Ultraviolet Fluorescence
RHINELANDER TOWER	55-085-0996-42401-1	SLAMS	100	Ultraviolet Fluorescence

Appendix B:

Waivers and Approvals

Summary

EPA establishes minimum requirements for air monitoring networks. However, EPA can waive many of these requirements. For example, EPA establishes the minimum sampling frequencies for PM_{2.5} monitors. Deviations from these minimums may be granted by submitting requests to the EPA Regional Administrator based on factors including the historical PM_{2.5} data quality assessments, the location of current PM_{2.5} design value sites and regulatory data needs. Approved deviations from the minimum sampling frequencies are formalized in waivers. This appendix contains air monitoring waivers and any associated approvals.

Federal Regulation

Specific types of waivers appear in a number of sections in 40 CFR § 58.

Table of Contents

Summary	1
Federal Regulation	1
Table of Contents.....	2
List of Figures.....	2
Waivers and Approvals	3
Bad River Tribal – School Odanah (55-003-0010).....	3
Devils Lake Park (55-111-0007).....	3
Eau Claire-DOT Sign Shop (55-035-0014).....	3
Green Bay East High (55-009-0005).....	3
Harrington Beach (55-089-0009).....	3
Kenosha - Water Tower (55-059-0025)	3
La Crosse (55-063-0012)	3
Madison – East (55-025-0041).....	3
Milwaukee - College Ave. Park & Ride (55-079-0058).....	3
Milwaukee - College Ave. NR (55-079-0056)	4
Milwaukee – SER DNR Hdqrs (55-079-0026)	4
Perkinstown (55-119-8001)	4
Potawatomi (55-041-0007).....	4
Potosi (55-043-0009)	4
Trout Lake (55-125-0001)	4
Sheboygan - Haven (55-117-0009)	4

List of Figures

Figure 1: Bad River School – Odanah Collocated PM _{2.5} FRM Shutdown Approval.....	5
Figure 2: Kenosha - Water Tower Ozone Monitor Approval	6
Figure 3: Potosi PM _{2.5} FRM Shutdown Approval.....	7
Figure 4: Sheboygan - Haven Ozone Monitor Approval	8
Figure 5: FRM Shutdown Approvals - February 13, 2018	9

Waivers and Approvals

Bad River Tribal – School Odanah (55-003-0010)

- EPA approved shutdown of collocated Federal Reference Method (FRM) monitor in March of 2017. See Figure 1.
- PM2.5 sampling frequency waiver was granted as referred to in 40 CFR § 58.12(d)(1)(i) in the 2017 Annual Network Plan approval.

Devils Lake Park (55-111-0007)

- PM2.5 sampling frequency waiver was granted as referred to in 40 CFR § 58.12(d)(1)(i) in the 2017 Annual Network Plan approval.
- Shutdown of two FRMs was approved in a US EPA (Environmental Protection Agency) letter received on 2/13/2018. See Figure 5.

Eau Claire-DOT Sign Shop (55-035-0014)

- Shutdown of a FRM was approved in a US EPA letter received on 2/13/2018. See Figure 5.

Green Bay East High (55-009-0005)

- Shutdown of two FRMs was approved in a US EPA letter received on 2/13/2018. See Figure 5.

Harrington Beach (55-089-0009)

- PM2.5 sampling frequency waiver was granted as referred to in 40 CFR § 58.12(d)(1)(i) in the 2017 Annual Network Plan approval.

Kenosha - Water Tower (55-059-0025)

- EPA approved that after 24 months of operation the ozone monitor will retain a monitor type of SPM and the monitor measurements will be considered comparable to the ozone National Ambient Air Quality Standard (NAAQS). See Figure 2.

La Crosse (55-063-0012)

- Shutdown of a FRM was approved in a US EPA letter received on 2/13/2018. See Figure 5.

Madison – East (55-025-0041)

- PM2.5 sampling frequency waiver was granted as referred to in 40 CFR § 58.12(d)(1)(i) in the 2017 Annual Network Plan approval.

Milwaukee - College Ave. Park & Ride (55-079-0058)

- Shutdown of a FRM was approved in a US EPA letter received on 2/13/2018. See Figure 5.

Milwaukee - College Ave. NR (55-079-0056)

- Shutdown of a FRM was approved in a US EPA letter received on 2/13/2018. See Figure 5.

Milwaukee – SER DNR Hdqrs (55-079-0026)

- PM2.5 sampling frequency waiver was granted as referred to in 40 CFR § 58.12(d)(1)(i) in the 2017 Annual Network Plan approval.

Perkinstown (55-119-8001)

- PM2.5 sampling frequency waiver was granted as referred to in 40 CFR § 58.12(d)(1)(i) in the 2017 Annual Network Plan approval.

Potawatomi (55-041-0007)

- PM2.5 sampling frequency waiver was granted as referred to in 40 CFR § 58.12(d)(1)(i) in the 2017 Annual Network Plan approval.

Potosi (55-043-0009)

- EPA approved shutdown of FRM monitor and designation of the Federal Equivalent Method (FEM) monitor as primary in March of 2017. See Figure 3.

Trout Lake (55-125-0001)

- PM2.5 sampling frequency waiver was granted as referred to in 40 CFR § 58.12(d)(1)(i) in the 2017 Annual Network Plan approval.

Sheboygan - Haven (55-117-0009)

- EPA approved that after 24 months of operation the ozone monitor will retain a monitor type of SPM and the monitor measurements will be considered comparable to the ozone NAAQS. See Figure 4.

Figure 1: Bad River School – Odanah Collocated PM_{2.5} FRM Shutdown Approval



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3580

JAN 26 2017

REPLY TO THE ATTENTION OF:

Ms. Gail Good
Director, Bureau of Air Management
Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, Wisconsin 53707-7921

Dear Ms. Good:

The U.S. Environmental Protection Agency has reviewed Wisconsin Department of Natural Resources' (WDNR) proposal of December 27, 2016, to modify its air monitoring network. Specifically, WDNR, on behalf of the Bad River Tribe, is requesting approval to shut down the collocated PM_{2.5} Federal Reference Method (FRM) sampler located at the Bad River site in Ashland County (Site ID: 55-003-0010).

EPA approves shutdown of the Bad River collocated PM_{2.5} FRM sampler. With twenty one PM_{2.5} FRM samplers operating statewide, 40 CFR Part 58, Appendix A, Section 3.2.3.1 requires three collocated FRM samplers. This requirement is satisfied with the three monitoring sites that will continue to operate collocated samplers, namely, Milwaukee SER, Milwaukee 16th Street, and Green Bay East. Please note and add an explanation of this network change in WDNR's forthcoming 2018 annual network plan.

We understand and agree that the resources made available by the collocated PM_{2.5} FRM shutdown will be used to operate the new primary PM_{2.5} FRM sampler at Bad River. In addition, we encourage continued coordination between WDNR and the Bad River Tribe towards the purchase and installation of a new Met One BAM continuous PM_{2.5} analyzer.

EPA appreciates our partnership with WDNR in monitoring air quality. If you have any question or comments regarding this approval, please contact Michael Compher, Air Monitoring and Analysis Section Chief, at (312) 886-5745.

Sincerely,

Edward Nam
Director
Air and Radiation Division

Figure 2: Kenosha - Water Tower Ozone Monitor Approval



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3580

MAR 31 2015

REPLY TO THE ATTENTION OF:

Bart Sponseller
Deputy Division Administrator
Air, Waste, Remediation, and Redevelopment Division
Wisconsin Department of Natural Resources
101 South Webster Street
Madison, Wisconsin 53703

Subject: Kenosha Water Tower Special Purpose Monitor (Site ID: 55-059-0025)

Dear Mr. Sponseller:

As background, Wisconsin Department of Natural Resources (WDNR), began operating the seasonal ozone special purpose monitoring (SPM) site at Kenosha – Water Tower (Site ID: 55-059-0025) in May, 2013, in response to significant public and industry concern regarding the partial Kenosha County nonattainment area for the 2008 ozone National Ambient Air Quality Standard (NAAQS). The monitor also helps WDNR and the Lake Michigan Air Directors Consortium understand ozone formation and transport in southeastern Wisconsin and along the Lake Michigan lakeshore. For these reasons, WDNR would like to continue operating the Kenosha – Water Tower monitor for one or more additional ozone seasons as a SPM.

The Environmental Protection Agency confirms that WDNR may continue to operate the special purpose Kenosha – Water Tower ozone monitoring site (site ID: 55-059-0025) beyond 24 months. As a special purpose monitor (SPM), it will not be required to meet shutdown criteria in 40 CFR Part 58.14(c)(2). WDNR should include this monitor in the annual air monitoring network plan as an SPM, noting that WDNR may re-evaluate the need to continue this monitoring site after the conclusion of the 2015 ozone season. Although this site will continue to be considered a SPM, data collected from this monitor after 24 months of operation may be utilized for comparison to the applicable NAAQS, as described in 40 CFR Part 58.20.

If you have any additional questions about this matter, please contact Michael Compher, of my staff, at (312) 886-5745.

Sincerely,

Mary Pat Tyson
Branch Chief
Region 5 Air Toxics and Assessment Branch

Figure 3: Potosi PM_{2.5} FRM Shutdown Approval



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3500

REPLY TO THE ATTENTION OF:

Ms. Gail Good
Director, Bureau of Air Management
Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, Wisconsin 53707-7921

Dear Ms. Good:

The U.S. Environmental Protection Agency (EPA) has reviewed the Wisconsin Department of Natural Resources' (WDNR) request of February 2, 2017, to modify its air monitoring network. Specifically, WDNR is requesting approval to remove the PM_{2.5} Federal Reference Method (FRM) sampler at the Potosi site in Grant County (Site ID: 55-043-0009) and continue operation of the Beta Attenuation Mass (BAM) as a Federal Equivalent Method (FEM) monitor.

EPA approves removal of the PM_{2.5} FRM filter collection sampler at Potosi and continuation of the BAM as an FEM. After implementing this change on March 15th, the FEM monitor will be designated as the primary PM_{2.5} monitor at this site. Please note and discuss this network change and address collocation requirements in WDNR's forthcoming 2018 annual network plan. Additionally, EPA requests WDNR ensure that all monitor description data in EPA's Air Quality System is appropriately updated to reflect these changes.

EPA appreciates our partnership with WDNR in monitoring air quality. If you have any questions or comments regarding this approval, please contact Michael Compher, Air Monitoring and Analysis Section Chief, at (312) 886-5745.

Sincerely,

Edward Nam
Director
Air and Radiation Division

Figure 4: Sheboygan - Haven Ozone Monitor Approval

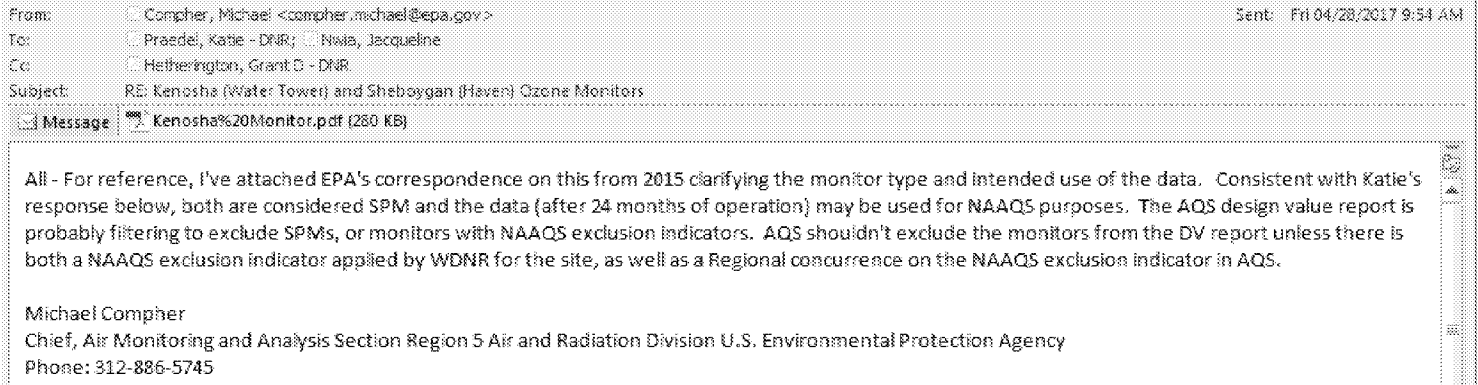


Figure 5: FRM Shutdown Approvals - February 13, 2018



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3500

FEB 13 2018

REPLY TO THE ATTENTION OF:

Ms. Gail Good
Director, Bureau of Air Management
Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, Wisconsin 53707-7921

Dear Ms. Good:

The U.S. Environmental Protection Agency reviewed the Wisconsin Department of Natural Resources' (WDNR) January 4, 2018 PM_{2.5} Network Modification request, proposing to remove nine PM_{2.5} Federal Reference Method (FRM) samplers at seven sites statewide and continue operation of Federal Equivalent Method (FEM) continuous Beta Attenuation Monitors (BAMs). EPA evaluated the network modifications, along with data and information about the monitoring sites submitted to the Air Quality System database, and confirms that your network would meet the operational requirements of 40 CFR Part 58, including collocation requirements.

We acknowledge and approve the following specific modifications:

PM_{2.5} FRM Discontinuation at Select Sites

WDNR proposed to discontinue nine FRMs at seven monitoring sites: Devil's Lake Park (two FRMs at 55-111-0007), Eau Claire (55-035-0014), Green Bay (two FRMs at 55-009-0005), La Crosse (55-063-0012), Madison East (55-025-0041), Milwaukee College Ave NE (55-079-0056) and Milwaukee College Ave Park and Ride (55-079-0058). FEM continuous Met One BAM 1020 PM_{2.5} VSOC samplers will continue to operate at these sites as primary samplers. Data at sites with collocated samplers will be processed in accordance with 40 CFR Part 50, Appendix N, Section 3(d), which requires that data from the designated primary monitor will be used for comparison with the PM_{2.5} National Ambient Air Quality Standards.

PM_{2.5} Statewide Collocation Requirements

WDNR's continued optimization of their PM_{2.5} network, including discontinuation of the aforementioned FRM samplers and designation of additional FEMs samplers as primary, impacts their PM_{2.5} collocation requirements. As of April 1, 2018, Wisconsin will operate 17 FEM primary and three FRM primary samplers. The collocation requirements, prescribed in 40 CFR Part 58, Appendix A, will be met as follows: FRM/FEM - Milwaukee 16th Street Health Center (55-079-0010) and Waukesha Cleveland Avenue (55-133-0027); FEM/FEM - Devil's Lake (55-111-0007); and FRM/FRM - Milwaukee DNR HQ (55-079-0026).

EPA appreciates your partnership in conducting ambient air monitoring. We look forward to working with you to continuously improve the quality of ambient air in Wisconsin. If you have

Revised/Revised date • Printed with vegetable oil-based inks on 100% Recycled Paper (100% Post Consumer)

Figure 5: FRM Shutdown Approvals - February 13, 2018 (cont.)

any questions or comments, please contact Michael Coughlin, Air Monitoring and Analysis Section Chief, at (312) 886-5745.

Sincerely,



Edward Nann
Director
Air and Radiation Division

Appendix C:

Memorandums of Agreement

Summary

Due to the geographic monitoring boundaries determined by USEPA, Wisconsin is working collaboratively with adjacent states to meet 40 CFR 58 Appendix D, Section 2(e) minimum monitoring requirements. Memorandum of Agreements (MOAs) are designed to reaffirm that we are meeting monitoring requirements established by EPA. The two following MOAs constitute this reaffirmation.

DNR reconfirmed with Minnesota Pollution Control Agency's monitors are meeting minimum monitoring requirements. Due to the age of the MOA, an updated Minnesota-Wisconsin MOA will be developed to reflect current monitoring configurations.

Federal Regulation

40 CFR § 58 Appendix D to Part 58 2(e) This appendix uses the statistical-based definitions for metropolitan areas provided by the Office of Management and Budget and the Census Bureau. These areas are referred to as metropolitan statistical areas (MSA), micropolitan statistical areas, core-based statistical areas (CBSA), and combined statistical areas (CSA). A CBSA associated with at least one urbanized area of 50,000 population or greater is termed a Metropolitan Statistical Area (MSA). A CBSA associated with at least one urbanized cluster of at least 10,000 population or greater is termed a Micropolitan Statistical Area. CSA consist of two or more adjacent CBSA. In this appendix, the term MSA is used to refer to a Metropolitan Statistical Area. By definition, both MSA and CSA have a high degree of integration; however, many such areas cross State or other political boundaries. MSA and CSA may also cross more than one air shed. The EPA recognizes that State or local agencies must consider MSA/CSA boundaries and their own political boundaries and geographical characteristics in designing their air monitoring networks. The EPA recognizes that there may be situations where the EPA Regional Administrator and the affected State or local agencies may need to augment or to divide the overall MSA/CSA monitoring responsibilities and requirements among these various agencies to achieve an effective network design. Full monitoring requirements apply separately to each affected State or local agency in the absence of an agreement between the affected agencies and the EPA Regional Administrator.

Table of Contents

Memorandum of Agreement with Minnesota	3
Memorandum of Agreement with Illinois and Indiana	7

Memorandum of Agreement with Minnesota

Memorandum of Agreement Air Quality Monitoring for Criteria Pollutants for the Minneapolis – St. Paul, MN-WI Metropolitan Statistical Area (MSA)

Participating Agencies:

Minnesota Pollution Control Agency (MPCA)
Environmental Analysis and Outcomes Division

Wisconsin Department of Natural Resources (WDNR)
Bureau of Air Management

Purpose, Objectives and Goals

The purpose of this Memorandum of Agreement (MOA) is to establish the Minneapolis-St. Paul, MN-WI MSA Criteria Pollutants Air Quality Monitoring Agreement between the MPCA and WDNR to collectively meet United States Environmental Protection Agency (US EPA) minimum monitoring requirements for:

- Particles of an aerodynamic diameter of 10 micrometers and less (PM₁₀),
- Particles of an aerodynamic diameter of 2.5 micrometers and less (PM_{2.5}),
- Ozone (O₃),
- Sulfur Dioxide (SO₂),
- Nitrogen Dioxide (NO₂),
- Carbon Monoxide (CO),
- Lead (Pb), and
- Other criteria pollutants as deemed necessary to meet the needs of the MSA as determined reasonable by all parties.

The Minneapolis-St. Paul, MN-WI MSA had an estimated population of 3,208,212 in July, 2007. The MSA consists of 11 counties in Minnesota (Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Sherburne, Washington, and Wright) and 2 counties in Wisconsin (Pierce, St. Croix).

According to 40 CFR Part 58, Appendix D, the Minneapolis-St. Paul, MN-WI MSA minimum monitoring requirements (based on an estimated population of 3,208,212) are:

Monitors Required	Parameter
2-4	PM ₁₀
3	PM _{2.5}
2	Ozone
2	Sulfur Dioxide by January 1, 2013
1	Carbon Monoxide

Monitors Required	Parameter
2	Near-road NO ₂ by January 1, 2013
1	Area-wide NO ₂ by January 1, 2013
1	Lead at NCore by December 27, 2011

This MOA will formalize the collective agreement between the MPCA and WDNR to provide adequate criteria pollutant monitoring for the Minneapolis-St. Paul, MN-WI MSA as required by 40 CFR 58 Appendix D, Section 2(e).

To meet the minimum monitoring requirements for the Minneapolis-St. Paul, MN-WI MSA, the following sites will collect the required parameters during the 2011 monitoring year:

County	AQS ID	Site Name	PM _{2.5} FRM	PM _{2.5} Continuous (FRM)	PM _{2.5} Continuous (non-FRM)	PM _{2.5} Speciation	PM _{2.5} Collocated	PM ₁₀	TSP / Lead	Ozone	Oxides of Nitrogen	Sulfur Dioxide	Carbon Monoxide
Anoka	27-003-1001	Cedar Creek								X			
Anoka	27-003-1002	Blaine -NCore	X	X		X		X ^C	2012	X	X ¹	X ¹	X ¹
Dakota	27-037-0020	FHR 420							X		X	X	X
Dakota	27-037-0423	FHR 423									X	X	X
Dakota	27-163-0442	FHR 442										X	
Dakota	27-037-0443	FHR 443										X	
Dakota	27-037-0470	Apple Valley	X		X				X				
Hennepin	27-053-0954	Arts Center										X	X
Hennepin	27-053-0963	H.C. Andersen School	X	X		X			X				
Hennepin	27-053-0966	City of Lakes						X	X				
Hennepin	27-053-1007	Humboldt Avenue						X	X				
Hennepin	27-053-2006	St. Louis Park	X										
Ramsey	27-123-0050	Lexington Avenue											X
Ramsey	27-123-0866	Red Rock Road						X					
Ramsey	27-123-0868	Ramsey Health Center	X					X ^C					
Ramsey	27-123-0871	Harding High School	X	X			X		X				
Scott	27-139-0505	Shakopee	X							X			

^C = continuous, ¹ = trace

County	AQS ID	Site Name	PM _{2.5} FRM	PM _{2.5} Continuous (FEM)	PM _{2.5} Continuous (non-FEM)	PM _{2.5} Speciation	PM _{2.5} Collocated	PM ₁₀	TSP / Lead	Ozone	Oxides of Nitrogen	Sulfur Dioxide	Carbon Monoxide
Washington	27-163-0436	MPC 436										X	
Washington	27-163-0438	MPC 438							X				
Washington	27-163-0446	Point Road							X				
Washington	27-163-6015	Stillwater Twp								X			
Wright	27-173-3200	St. Michael			X					X			
Total			7	3	2	2	1	5	9	5	3	7	5

Responsibilities/Actions

Each of the parties to this Agreement is responsible for ensuring that its obligations under the MOA are met. As conditions warrant, the affected agencies may conduct telephone conference calls, meetings, or other communications to discuss monitoring activities for the MSA. Each affected agency shall inform the other affected agencies via telephone or email of any monitoring changes occurring within its jurisdiction of the MSA at its earliest convenience, after learning of the need for the change or making the changes. Such unforeseen changes may include evictions from monitoring sites, destruction of monitoring sites due to natural disasters, or any occurrences that result in an extended (greater than a quarter) or permanent change in the monitoring network.

Limitations

- All commitments made in this MOA are subject to the availability of appropriated funds and each agency's budget priorities. Nothing in this MOA obligates MPCA or WDNR to expend appropriations or to enter into any contract, assistance agreement, interagency agreement or other financial obligation.
- This MOA is neither a fiscal nor a funds obligation document. Any endeavor involving reimbursement or contribution of funds between parties to this agreement will be handled in accordance with applicable laws, regulations and procedures and will be subject to separate agreements that will be affected in writing by representatives of the parties.
- This MOA does not create any right or benefit enforceable by law or equity against MPCA or WDNR, their officers or employees or any other person. This MOA does not apply to any entity outside MPCA or WDNR.

- No proprietary information or intellectual property is anticipated to arise out of this MOA.

Termination

This Memorandum of Agreement may be revised upon the mutual consent of MPCA and WDNR. Each party reserves the right to terminate this MOA. A thirty (30) day written notice must be given prior to the date of termination.

Approvals

We agree with the provisions outlined in this Memorandum of Agreement and commit our agencies to implement them in a spirit of cooperation and mutual support.

Minnesota Pollution Control Agency
Environmental Analysis and Outcomes Division

By: 

Title: Director

Date: 1/25/11

Wisconsin Department of Natural Resources
Bureau of Air Management

By: 

Title: Director

Date: 1/31/11

Memorandum of Agreement with Illinois and Indiana

**MEMORANDUM OF AGREEMENT
BETWEEN
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
WISCONSIN DEPARTMENT OF NATURAL RESOURCES
AND
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT,
OFFICE OF AIR QUALITY**

This Memorandum of Agreement (MOA) is made and entered into by the Illinois Environmental Protection Agency (Illinois EPA), Wisconsin Department of Natural Resources (WDNR), and Indiana Department of Environmental Management (IDEM) Office of Air Quality (OAQ), who shall be collectively referred to as the PARTIES.

I. PURPOSE

The purpose of this MOA is to document the means by which the PARTIES collectively meet United States Environmental Protection Agency (USEPA) minimum air quality monitoring requirements in the Chicago-Naperville-Elgin, IL-IN-WI Metropolitan Statistical Area (MSA) for criteria pollutants. These include particles of an aerodynamic diameter of 10 micrometers and less (PM₁₀), particles of an aerodynamic diameter of 2.5 micrometers and less (PM_{2.5}), ozone, and other criteria pollutants for which monitoring is deemed necessary. According to 40 CFR Part 58, Appendix D, the Chicago-Naperville-Elgin, IL-IN-WI MSA minimum monitoring requirements (based on a population of 9,537,289 from a 2013 estimate using Census 2010) are three (3) ozone monitors, two to four (2-4) PM₁₀ monitors, three (3) Federal Equivalent Method (FEM) continuous or Federal Reference Method (FRM) PM_{2.5} monitors, two (2) collocated continuous PM_{2.5} monitors with the FRM PM_{2.5} monitors, three (3) sulfur dioxide monitors, two (2) near-road nitrogen dioxide monitors, one (1) area-wide nitrogen dioxide monitor, one (1) carbon monoxide monitor, and one (1) lead monitor.

II. UNDERSTANDING

It is mutually agreed upon and understood among the PARTIES to this MOA that, as a whole, the PARTIES meet USEPA minimum monitoring requirements. This MOA shall be effective upon execution of a Signature Page by all PARTIES. This MOA may be executed in one or more counterparts, each of which shall be deemed an original to all PARTIES of this MOA. The current number of monitors in each county for the MSA monitoring network is provided in the tables below. A map of the monitor locations is also provided below. It is understood by all PARTIES that each PARTY may, on its own accord, make changes within its jurisdiction of the MSA, consistent with applicable regulations and as approved by USEPA, without any additional requirements being imposed by this MOA.

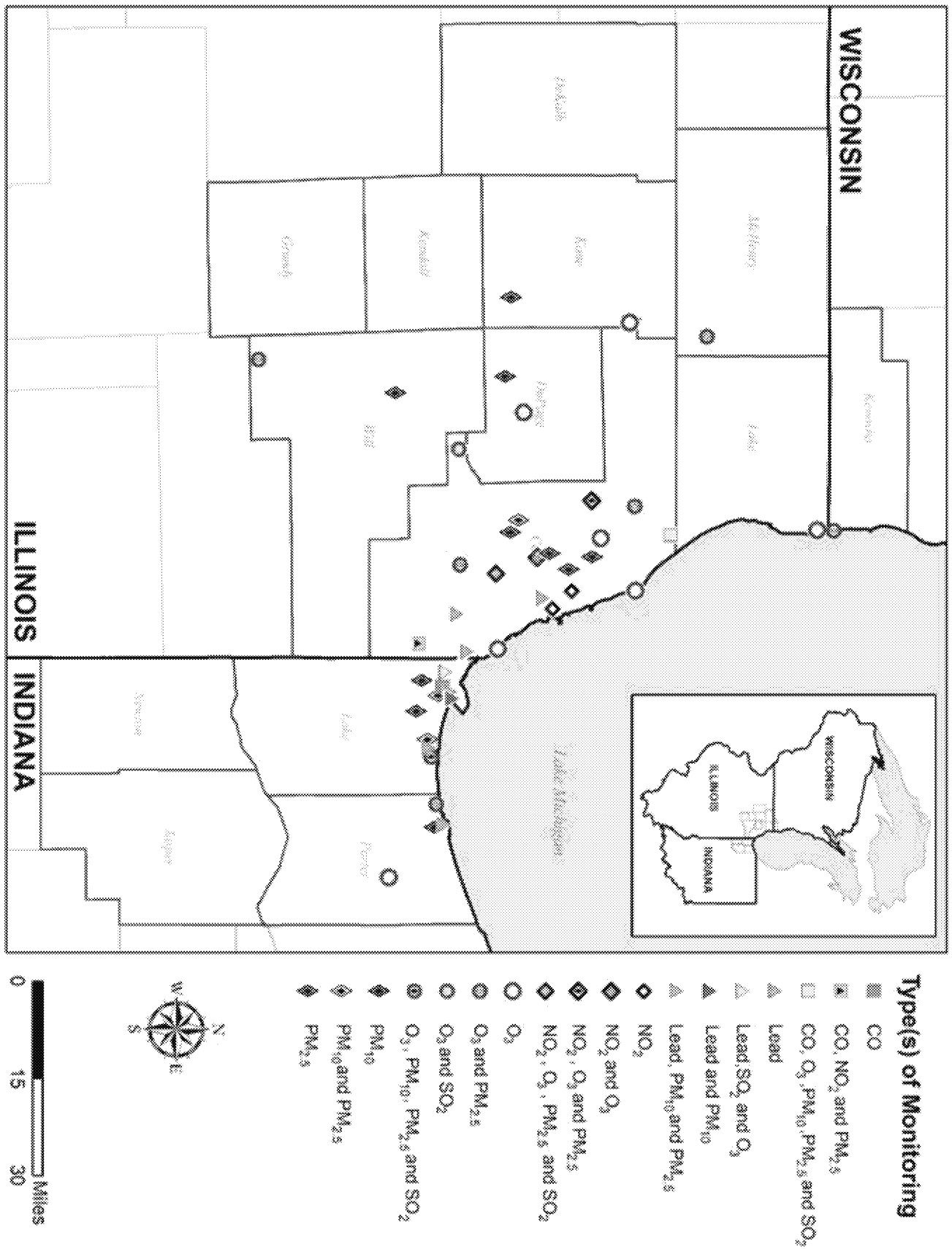
Criteria Air Pollutant MSA Monitoring Network Excluding PM2.5

State / FIPS State ID	County / FIPS County ID	PM10	O ₃	NO2 Near- Road	NO2 Community Wide	CO	SO ₂	LEAD
Illinois / 17	Cook / 031	3	10	2	4	2	3	3
Illinois / 17	DeKalb / 037	0	0	0	0	0	0	0
Illinois / 17	DuPage / 043	0	1	0	0	0	0	0
Illinois / 17	Grundy / 063	0	0	0	0	0	0	0
Illinois / 17	Kane / 089	0	1	0	0	0	0	1
Illinois / 17	Kendall / 093	0	0	0	0	0	0	0
Illinois / 17	Lake / 097	0	1	0	0	0	0	0
Illinois / 17	McHenry / 111	0	1	0	0	0	0	0
Illinois / 17	Will / 197	0	1	0	0	0	0	0
Indiana / 18	Jasper / 073	0	0	0	0	0	0	0
Indiana / 18	Lake / 089	5	3	0	0	1	2	4
Indiana / 18	Newton / 111	0	0	0	0	0	0	0
Indiana / 18	Porter / 127	1	2	0	0	0	0	1
Wisconsin / 55	Kenosha / 059	0	2	0	0	0	0	0
Totals		9	22	2	4	3	5	9
Federal Requirement		2-4	3	3	1	1	3	1

PM2.5 MSA Monitoring Network

State / FIPS State ID	County / FIPS County ID	Federal Reference Method PM2.5	Federal Equivalent Method Continuous PM2.5	Speciation PM2.5	Collocated PM2.5
Illinois / 17	Cook / 031	11	6	3	3
Illinois / 17	DeKalb / 037	0	0	0	0
Illinois / 17	DuPage / 043	1	0	1	0
Illinois / 17	Grundy / 063	0	0	0	0
Illinois / 17	Kane / 089	1	1	0	0
Illinois / 17	Kendall / 093	0	0	0	0
Illinois / 17	Lake / 097	0	0	0	0
Illinois / 17	McHenry / 111	0	1	0	0
Illinois / 17	Will / 197	1	1	0	0
Indiana / 18	Jasper / 073	0	0	0	0
Indiana / 18	Lake / 089	5	2	1	1
Indiana / 18	Newton / 111	0	0	0	0
Indiana / 18	Porter / 127	1	1	0	0
Wisconsin / 55	Kenosha / 059	1	0	0	0
Totals		21	12	5	4
Federal Requirement		3*	3*	2	2

*Requirement for either FRM or FEM monitors.



III. LIMITATIONS

- a. All commitments made in this MOA are subject to the availability of appropriated funds and each agency's budget priorities. Nothing in this MOA obligates any of the PARTIES to expend appropriations or to enter into any contract, assistance agreement, interagency agreement, or other financial obligation.
- b. This instrument is neither a fiscal nor a funds obligation document. Any endeavor or transfer of anything of value involving reimbursement or contribution of funds between PARTIES to this instrument shall be handled in accordance with applicable laws, regulations, and procedures including those for government procurement. Such endeavors will be outlined in separate agreements that shall be made in writing by representatives of the PARTIES and shall be independently authorized by appropriate statutory authority. This instrument does not provide such authority. Specifically, this instrument does not establish authority for non-competitive award to the cooperator of any contract or other agreement. Any contract or agreement for work or other services must fully comply with all applicable requirements for competition.
- c. This MOA does not bind the PARTIES to any requirements to which each PARTY would not otherwise be subject but for this MOA.
- d. This MOA does not create any right or benefit enforceable by law or equity against the PARTIES, their officers or employees, or any other person. This MOA does not apply to any entity outside the PARTIES.
- e. No proprietary information or intellectual property is anticipated to arise out of this MOA.

IV. TERMINATION

This MOA is effective through December 31, 2021, unless revised or terminated. This MOA may be revised upon the mutual written consent of all the PARTIES. Each party reserves the right to terminate this MOA. Such action will terminate this MOA for all affected agencies. A thirty (30) day written notice must be given prior to the date of termination.

IN WITNESS WHEREOF, the PARTIES hereto have executed this agreement:

Illinois Environmental Protection Agency

BY: 
Alec Messina

TITLE: Director, Illinois Environmental Protection Agency

DATE: 6/16/17

IN WITNESS WHEREOF, the PARTIES hereto have executed this agreement:

Indiana Department of Environmental Management
Office of Air Quality

BY: Keith Baugues
Keith Baugues

TITLE: Assistant Commissioner, Office of Air Quality

DATE: 6-5-17

IN WITNESS WHEREOF, the PARTIES hereto have executed this agreement:

Wisconsin Department of Natural Resources

BY: 

Cathy L. Stepp

TITLE: Secretary, Wisconsin Department of Natural Resources

DATE: May 25, 2017

Appendix D

2018 Air Monitoring Site Descriptions

Summary

The following pages are descriptions of WDNR Air Quality Monitoring Sites. Each site has its own page and each page is listed in the table of contents.

At the top of each page is the city where the site is located and the site name. Below the heading there is identification information for each site including the AQS site identification number, address, city, county, operating schedule, latitude, longitude, elevation, and year established. The next section of the page has a table of possible monitoring parameters and a map of Wisconsin. Parameters monitored at a particular site are indicated in the table. The Wisconsin map portrays the approximate location of the site within the state. Also, there is a smaller scale map of the site. This map indicates the major roadways or other geographic features that are near the site. It is followed by a recent picture of the monitors in their current location. The final section of the page contains a short site description, a list of monitoring objectives and any changes proposed for the site.

Federal Regulation

40 CFR § 58.10(a)(1) Annual monitoring network plan and periodic network assessment Beginning July 1, 2007, the State, or where applicable local, agency shall adopt and submit to the Regional Administrator an annual monitoring network plan which shall provide for the establishment and maintenance of an air quality surveillance system that consists of a network of SLAMS monitoring stations including FRM, FEM, and ARM monitors that are part of SLAMS, NCore stations, STN stations, State speciation stations, SPM stations, and/or, in serious, severe and extreme ozone nonattainment areas, PAMS stations, and SPM monitoring stations. The plan shall include a statement of purposes for each monitor and evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E of this part, where applicable...

Table of Contents

Summary	1
Federal Regulation	1
Table of Contents	2
Appleton AAL	3
Bad River Tribal School - Odanah	4
Bayside	5
Beloit - Converse	6
Brule River	7
Chiwaukee Prairie Stateline	9
Columbus	11
Devils Lake Park	12
Eau Claire – DOT Sign Shop	14
Expera - Kaukauna	16
Fond Du Lac	17
Grafton	18
Green Bay East High	19
Green Bay UW	21
Harrington Beach Park	22
Horicon Wildlife Area	24
Jefferson - Laatsch	26
Kenosha – Water Tower	27
Kewaunee	28
Kohler	29
La Crosse – DOT Building	31
Lake DuBay	33
Lake Geneva	34
Madison East	35
Madison University Avenue Well #6	37
Manitowoc WdInd Dunes	39
Milwaukee – College Ave. NR	40
Milwaukee College Ave. Park & Ride	42
Milwaukee SER WDNR Hdqrs	44
Milwaukee Sixteenth St. Health Center	46
Newport Park	48
Perkinstown	49
Potawatomi	51
Potosi	53
Racine – Payne and Dolan	55
Rhineland	56
Sheboygan-Haven	57
Trout Lake	58
Waukesha-Cleveland Ave	60

Appleton AAL

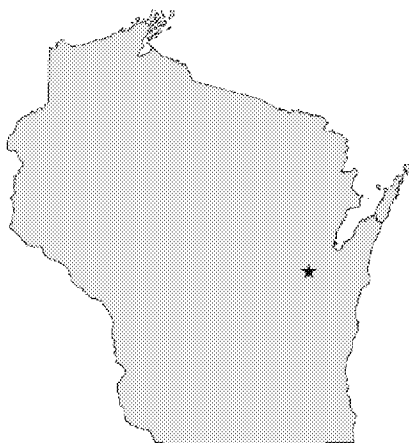
Site Information:

AQS Site ID: 55-087-0009

Address: 4432 N. Meade St.
AAL Building

City: Appleton

County: Outagamie



Operation: Year-round

Latitude: 44.3074

Longitude: -88.3951

Year Established: 1995

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	S0	Y0														
Monitor	M	H														

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

H = Highest Concentration

M = Max Ozone Concentration

O = Other

P = Population Exposure

Q = Quality Assurance

R = Regional Transport

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

1 = Daily

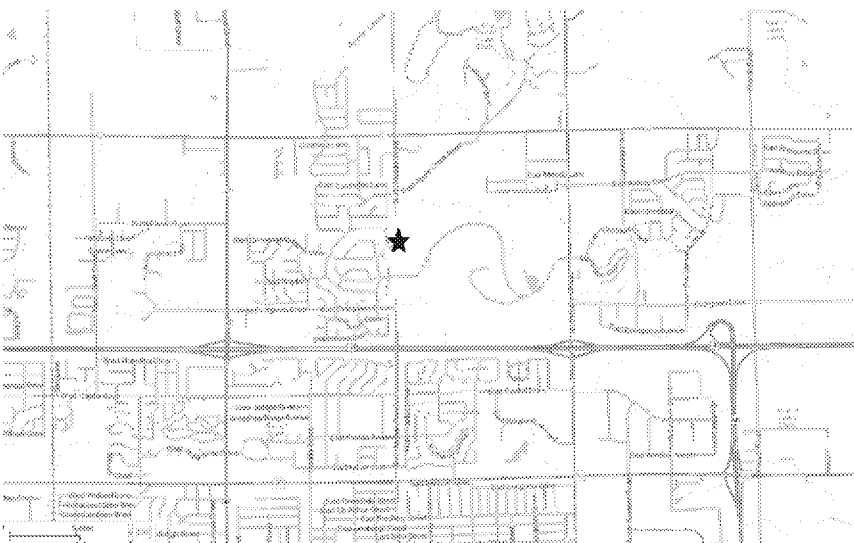
3 = Every 3rd Day

6 = Every 6th Day

12 = Every 12th Day

30 = Monthly

Site Description: This urban site is located in an Appleton neighborhood. The sample inlets are about 5 meters above ground level and 9-10.3 meters from nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Bad River Tribal School - Odanah

Site Information:

AQS Site ID: 55-003-0010

Address: Bad River School

City: Odanah

County: Ashland



Operation: Year-round

Latitude: 46.6023

Longitude: -90.6652

Year Established: 2002

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	Y0	Y6							Y0	Y0	Y0	Y0	Y0	Y0	Y0	
Monitor Objectives	G	G														

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

H = Highest Concentration

M = Max Ozone Concentration

O = Other

P = Population Exposure

Q = Quality Assurance

R = Regional Transport

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

1 = Daily

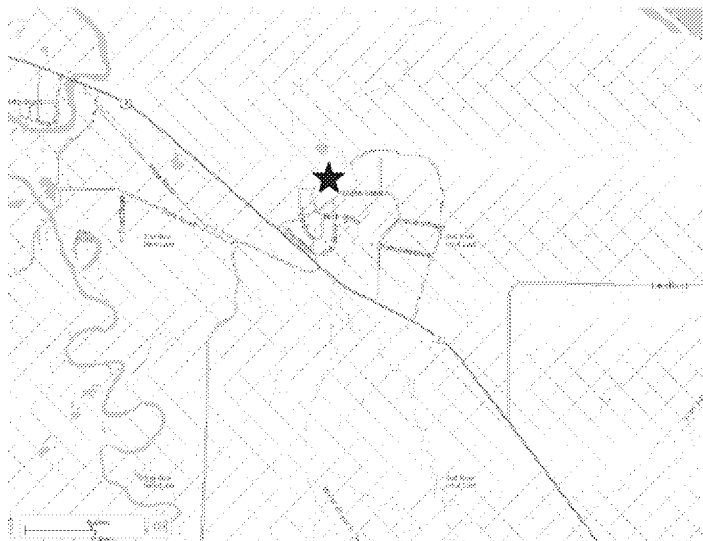
3 = Every 3rd Day

6 = Every 6th Day

12 = Every 12th Day

30 = Monthly

Site Description: This tribal site is located on the Bad River Reservation adjacent to the Tribal School. The sample inlets are 220 meters from the nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Bayside

Site Information:

AQS Site ID: 55-079-0085

Address: 601E. Ellsworth Ln.

City: Bayside

County: Milwaukee



Operation: Seasonal

Latitude: 43.181

Longitude: -87.901

Year Established: 1984

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	SO															
Monitor Objectives	P															

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

H = Highest Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This urban site is located in Milwaukee county in the community of Bayside. This site is located inside the Bayside Middle School in the boiler room. The sample inlet is 6.5 meters above ground level and 258 meters from the nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Beloit - Converse

Site Information:

AQS Site ID: 55-105-0030

Address: 1501 Ritsher St.

City: Beloit

County: Rock



Operation: Seasonal

Latitude: 42.518310

Longitude: -89.06347

Year Established: 2013

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	S0															
Monitor Objectives	M&R															

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

H = Highest Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

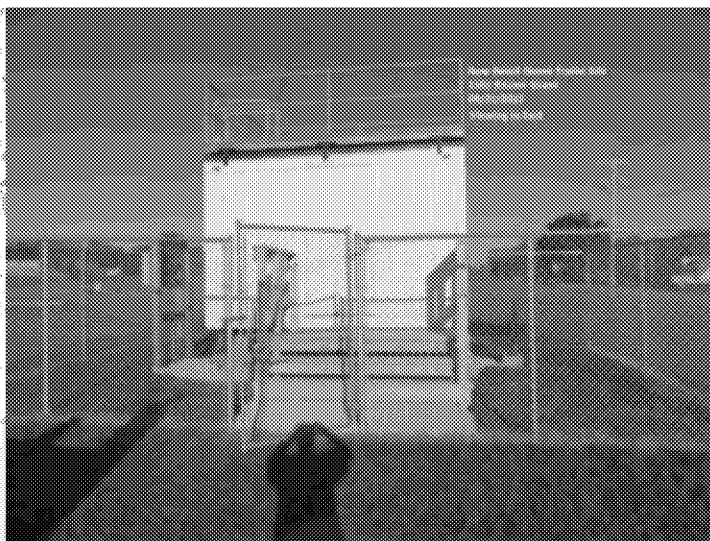
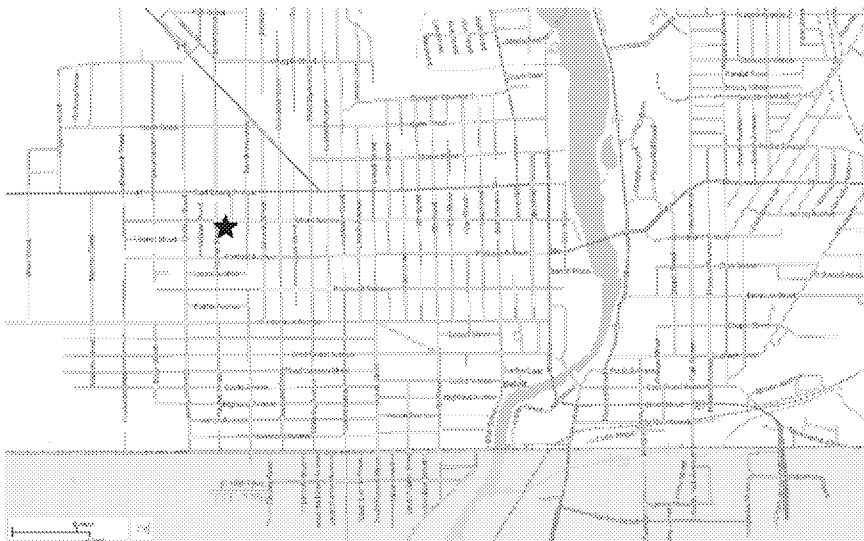
1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This suburban site is located near the Converse Elementary School in Beloit. The sample inlet is 5 meters above ground level and 4.9 meters from nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Brule River

Site Information:

AQS Site ID:

Address:

City: Brule River State Park

County: Douglas



Operation: Year-round

Latitude: 46.7466

Longitude: -91.6055

Year Established: 1996

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors																
Monitor Objectives																

* Reported to National Weather Service

	Metals (PM ₁₀)	VOC/Carbonyl	PAH	Hg*	CSN	AMNet*	AMoN**	MDN***	NTN***	IMPROVE
Monitors								Y	Y	
Monitor Objectives										

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Sampling Frequencies:

0 = Continuous

1 = Daily

3 = Every 3rd Day

6 = Every 6th Day

12 = Every 12th Day

30 = Monthly

90 = Quarterly

* For Hg and AMNet, elemental samples are of 5 minutes duration. For speciation, Hg samples are two-hour samples with an hour of analysis between samples.

** AMoN generates two-week composite samples.

*** NTN and MDN generate weekly composite samples.

Objectives: G = General / Background

NA = Not Applicable

Q = Quality Assurance

H = Highest Concentration

O = Other

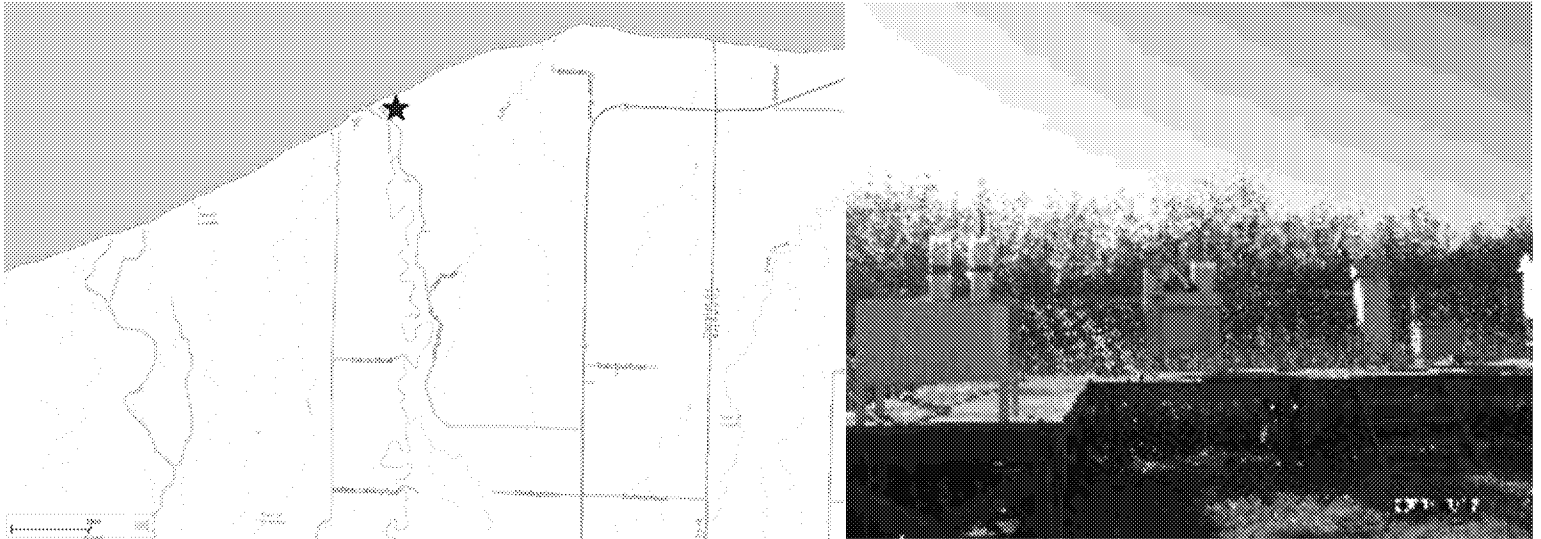
R = Regional Transport

M = Max Ozone Concentration

P = Population Exposure

SC = Source Oriented

Site Description: This rural site is located in Brule River State Park in a field at the end of Brule River Rd. on the east side of the road. This site monitors atmospheric mercury deposition. The mercury deposition sampler is located 78 meters from the nearest road. This is an NADP site that operates NTN and MDN samplers. The samplers are located 78 meters from the nearest road.



Chiwaukee Prairie Stateline

Site Information:

AQS Site ID: 55-059-0019

Address: 11838 First Court

City: Pleasant Prairie

County: Kenosha



Operation: Year-round

Latitude: 42.504722

Longitude: -87.8093

Year Established: 1988

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	S0	Y0							Y0	Y0	Y0				S0	
Monitor Objectives	M&R	R														

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

H = Highest Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This rural site is located in the Chiwaukee Prairie, a rural area near the Wisconsin-Illinois border. The sample inlets range from 4-5 meters above ground level and 13.7 meters from the nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Planned Changes:

- Replace BAM with Teledyne API T640 mass monitor.

Columbus

Site Information:

AQS Site ID: 55-021-0015

Address: N 1045 Wendt Rd.

City: Columbus

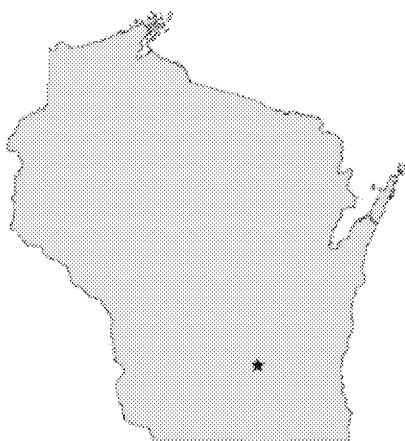
County: Columbia

Operation: Seasonal

Latitude: 43.3156

Longitude: -89.1089

Year Established: 1988



Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	S0															
Monitor Objectives	M															

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

H = Highest Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

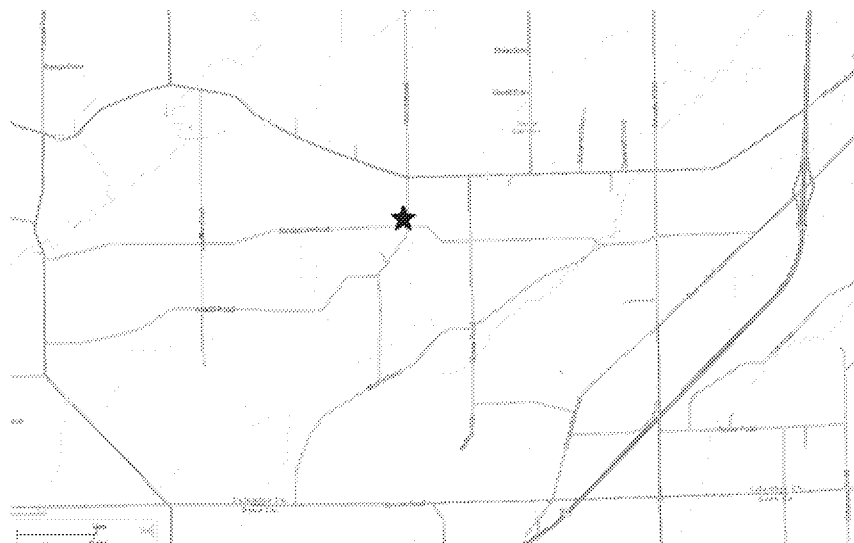
1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This rural site is located in Columbia County on Wendt Road. The sample inlet is 5 meters above ground level and 10 meters from nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Devils Lake Park

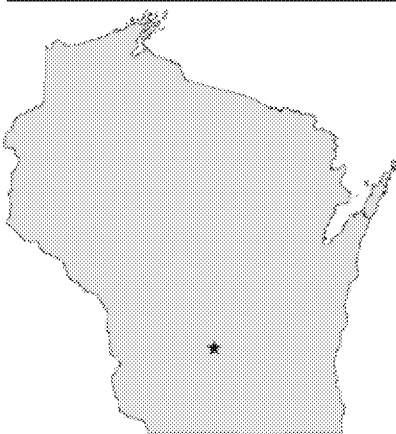
Site Information:

AQS Site ID: 55-111-0007

Address: E12886 Tower Rd.

City: Devils Lake State Park

County: Sauk



Operation: Year-round

Latitude: 43.4351

Longitude: -89.6797

Year Established: 1995

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	S0	Y0&Y0	Y0&Y0	Y0&Y0					Y0	Y0	Y0					
Monitor Objectives	G	G&Q	G&Q	G&Q												

* Reported to National Weather Service

	Metals (PM ₁₀)	VOC/Carbonyl	PAH	Hg*	CSN	AMNet*	AMoN**	MDN***	NTN***	IMPROVE
Monitors								Y	Y	
Monitor Objectives										

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Sampling Frequencies:

0 = Continuous

1 = Daily

3 = Every 3rd Day

6 = Every 6th Day

12 = Every 12th Day

30 = Monthly

90 = Quarterly

* For Hg and AMNet, elemental samples are of 5 minutes duration. For speciation, Hg samples are two-hour samples with an hour of analysis between samples.

**AMoN generates two-week composite samples.

*** NTN and MDN generate weekly composite samples.

Objectives: G = General / Background

NA = Not Applicable

Q = Quality Assurance

H = Highest Concentration

O = Other

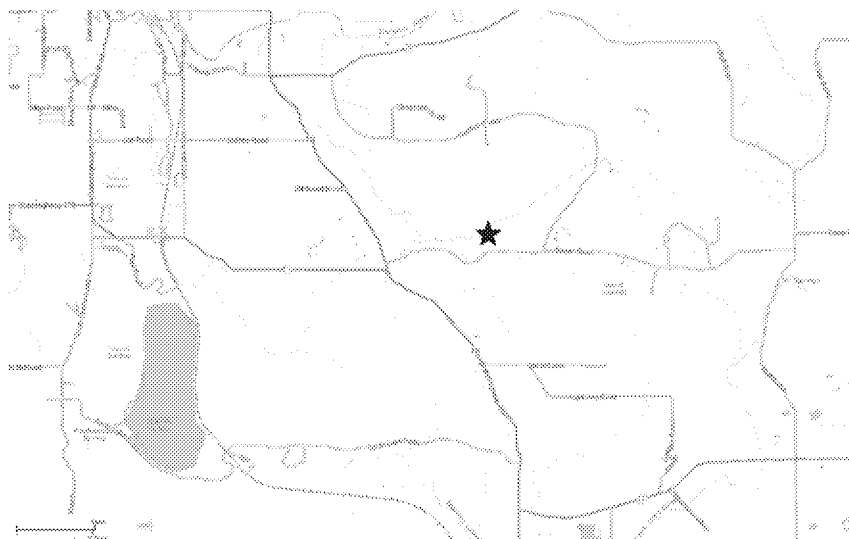
R = Regional Transport

M = Max Ozone Concentration

P = Population Exposure

SC = Source Oriented

Site Description: This rural site is located at Devils Lake State Park. The sample inlets range from 5-6.4 meters from the ground. The inlets are also 200 meters from the nearest rural road and 1,380 meters from the nearest state road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Eau Claire – DOT Sign Shop

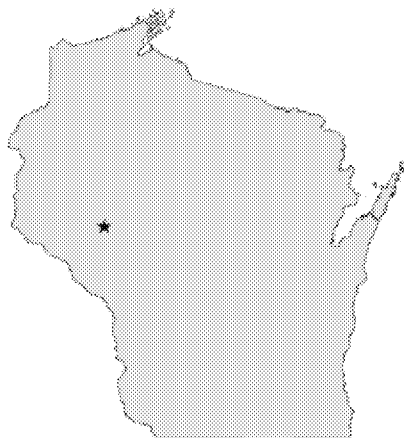
Site Information:

AQS Site ID: 55-035-0014

Address: 5505 Highway 53 South

City: Eau Claire

County: Eau Claire



Operation: Year-round

Latitude: 44.761

Longitude: -91.413

Year Established: 2011

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	S0	Y0							Y0	Y0						
Monitor Objectives	M	H														

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

H = Highest Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

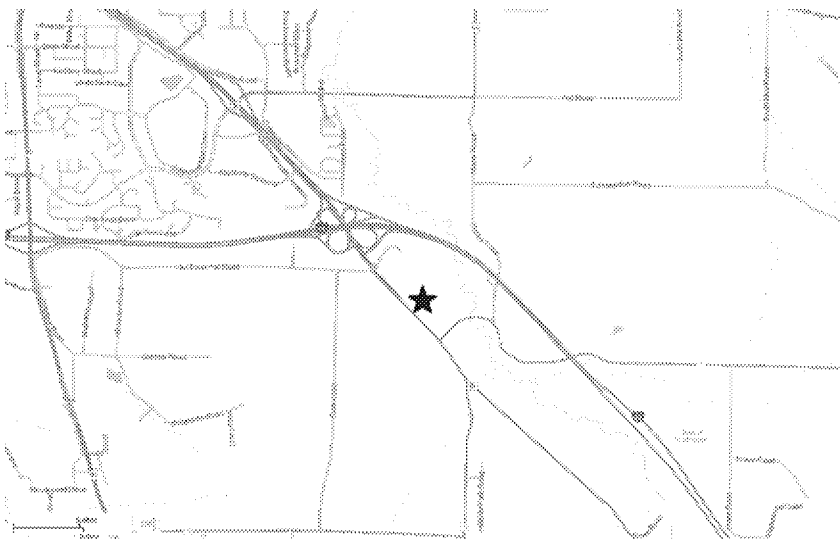
1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This site is located in a grassy clearing near a Wisconsin DOT facility. The sample inlets range from 5.3-7.8 meters above ground level and 149 meters from the nearest roadway. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Planned Changes:

- Replace BAM with Teledyne API T640 mass monitor.

Expera - Kaukauna

Site Information:

AQS Site ID: 55-087-0015

Address: 601 Plank Rd.

City: Kaukauna

County: Outagamie



Operation: Year-round

Latitude: 44.2893

Longitude: -88.2522

Year Established: 2017

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors					Y0				Y0	Y0	Y0					
Monitor Objectives					SC											

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

H = Highest Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

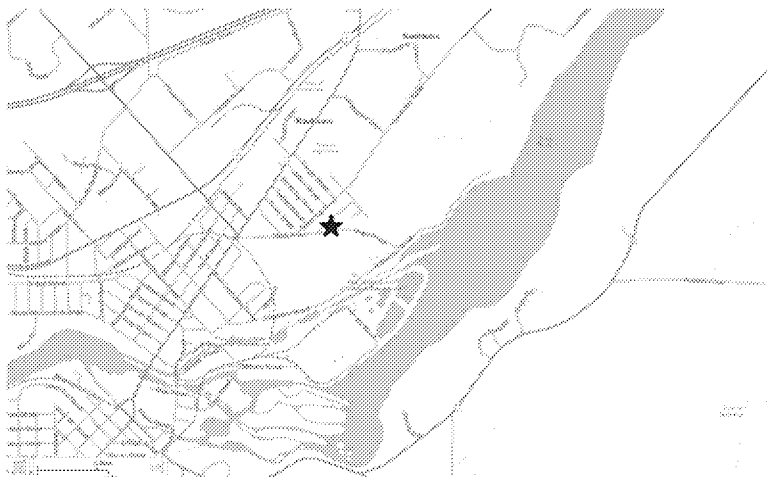
1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This site is located north of the Expera-Kaukauna facility at a quarry entrance on Plank Road. This site is within the area that was modeled to the highest normalized design value for SO₂. The sample inlet is 5.8 meters above ground level and 10 meters from the nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Planned Changes:

- Change operator to WDNR.

Fond du Lac

Site Information:

AQS Site ID: 55-039-0006

Address: N3996 Kelly Rd.

City: Byron

County: Fond du Lac



Operation: Seasonal

Latitude: 43.6874

Longitude: -88.422

Year Established: 1994

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	SO															
Monitor Objectives	M															

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

H = Highest Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This rural site is located in a farm field in the rural town of Byron. The sample inlet is 5 meters above ground level and 32.5 meters from nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Grafton

Site Information:

AQS Site ID: 55-089-0008

Address: N. Port Washington Rd.

City:

County: Ozaukee



Operation: Seasonal

Latitude: 43.3430

Longitude: -87.9200

Year Established: 1994

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	S0								S0	S0	S0				S0	
Monitor Objectives	R															

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

H = Highest Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This rural site is located off Highway I-43, next to the WE Energies landfill. The sample inlet is 5 meters above ground level and 19.5 meters from nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Green Bay East High

Site Information:

AQS Site ID: 55-009-0005

Address: 1415 Walnut St.

City: Green Bay

County: Brown



Operation: Year-round

Latitude: 44.50729

Longitude: -87.99344

Year Established: 1971

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors		Y0			Y0				Y0	Y0	Y0					
Monitor Objectives		H			P											

* Reported to National Weather Service

	Metals (PM ₁₀)	VOC/Carbonyl	PAH	Hg*	CSN	AMNet*	AMoN**	MDN***	NTN***	IMPROVE
Monitors					Y					
Monitor Objectives										

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Sampling Frequencies:

0 = Continuous

1 = Daily

3 = Every 3rd Day

6 = Every 6th Day

12 = Every 12th Day

30 = Monthly

90 = Quarterly

* For Hg and AMNet, elemental samples are of 5 minutes duration. For speciation, Hg samples are two-hour samples with an hour of analysis between samples.

**AMoN generates two-week composite samples.

*** NTN and MDN generate weekly composite samples.

Objectives: G = General / Background

NA = Not Applicable

Q = Quality Assurance

H = Highest Concentration

O = Other

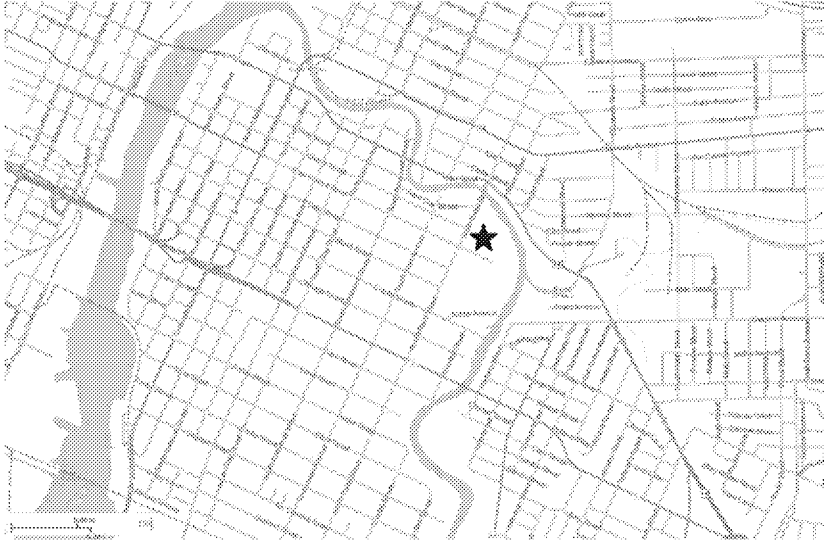
R = Regional Transport

M = Max Ozone Concentration

P = Population Exposure

SC = Source Oriented

Site Description: This site is located inside the Green Bay East High School. The sample inlets are 11-15 meters above the ground and 85 meters from nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Green Bay UW

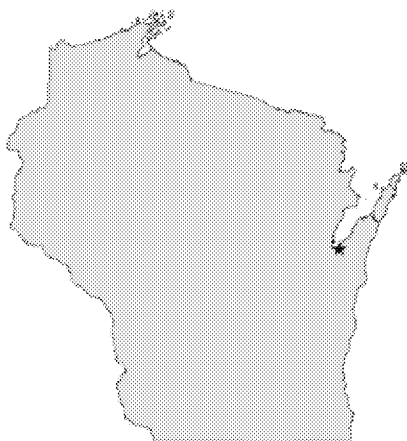
Site Information:

AQS Site ID: 55-009-0026

Address: HWYS 54 & 57

City: Green Bay

County: Brown



Operation: Seasonal

Latitude: 44.53098

Longitude: -87.90799

Year Established: 1994

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	SO															
Monitor Objectives	P															

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

H = Highest Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

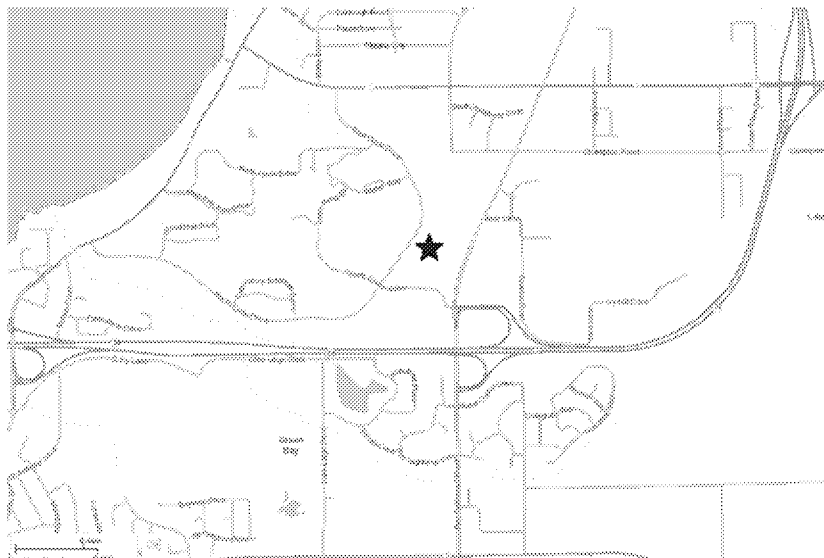
1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This site is located behind the University of Wisconsin—Green Bay campus. The sample inlet is 5 meters above ground level and 600 meters from nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Harrington Beach Park

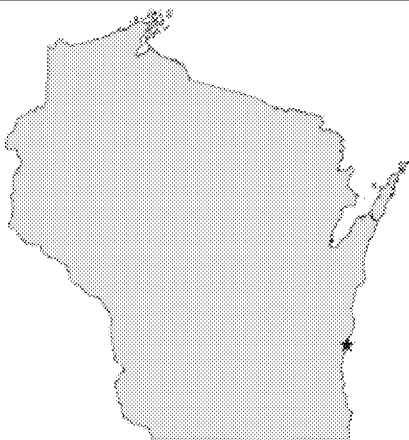
Site Information:

AQS Site ID: 55-089-0009

Address: 531 Hwy D

City: Belgium

County: Ozaukee



Operation: Year-round

Latitude: 43.4980

Longitude: -87.8100

Year Established: 1994

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	S0	Y0							Y0	Y0	Y0	Y0				
Monitor Objectives	M	R														

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

H = Highest Concentration

M = Max Ozone Concentration

O = Other

P = Population Exposure

Q = Quality Assurance

R = Regional Transport

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

1 = Daily

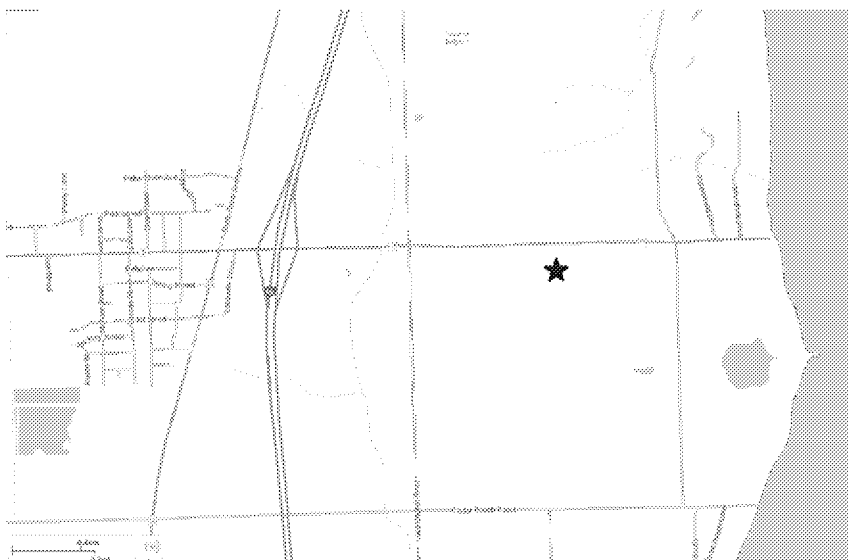
3 = Every 3rd Day

6 = Every 6th Day

12 = Every 12th Day

30 = Monthly

Site Description: This rural site is located at the Harrington Beach State Park. The sample inlets range from 3-5 meters above ground level and 34 meters from nearest state road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Planned Changes:

- Replace BAM with Teledyne API T640 mass monitor.

Horicon Wildlife Area

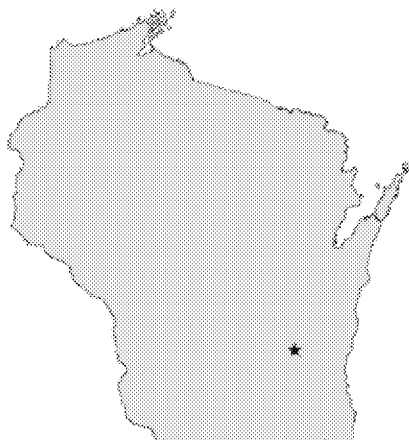
Site Information:

AQS Site ID: 55-027-0001

Address: 1210 N. Palmatory St.

City: Horicon

County: Dodge



Operation: Year-round

Latitude: 43.4661

Longitude: -88.6211

Year Established: 1982

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	Y0	Y0,6	Y0,6&90	Y0	Y0		Y0		Y0	Y0	Y0	Y0	Y0		Y0	Y0
Monitor Objectives	G	G&Q	G,Q&G	G	G		G									G

* Reported to National Weather Service

	Metals (PM ₁₀)	VOC/Carbonyl	PAH	Hg*	AMNet*	CSN	AMoN**	MDN***	NTN***	IMPROVE
Monitors	Y6,90	Y6	Y6,90	Y	Y	Y	Y			
Monitor Objectives	G&G	R	G&Q	O						

A = Proposed to Add
 S = Seasonal
 T = Proposed to Terminate
 Y = Year-round
 Sampling Frequencies:
 0 = Continuous
 1 = Daily
 3 = Every 3rd Day
 6 = Every 6th Day
 12 = Every 12th Day
 30 = Monthly
 90 = Quarterly

* For elemental Hg, samples are of 5 minutes duration. For speciation, Hg samples are two-hour samples with an hour of analysis between samples.

** AMoN generates two-week composite samples.

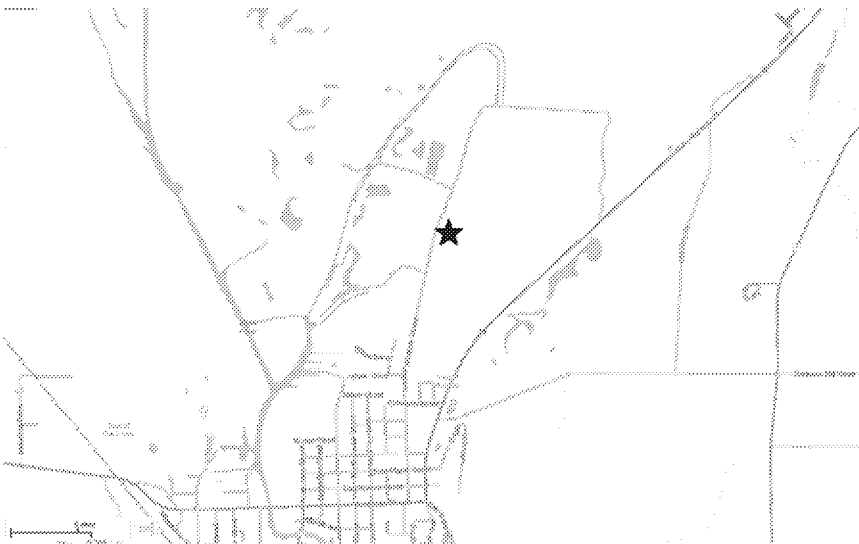
*** NTN and MDN generate weekly composite samples.

Objectives: G = General / Background
 NA = Not Applicable
 Q = Quality Assurance

H = Highest Concentration
 O = Other
 R = Regional Transport

M = Max Ozone Concentration
 P = Population Exposure
 SC = Source Oriented

Site Description: This rural site is located 42 m from the road. The sample inlets range from 3-10 meters above ground level and are 42 meters from a rural road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Planned Changes:

- Replace BAM with Teledyne API T640X mass monitor.

Jefferson - Laatsch

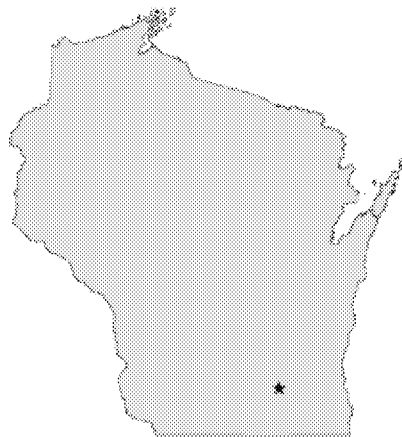
Site Information:

AQS Site ID: 55-055-0009

Address: N4440 Laatsch Ln.

City: Jefferson

County: Jefferson



Operation: Seasonal

Latitude: 43.0034

Longitude: -88.8283

Year Established: 1994

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	S0															
Monitor Objectives	G&R															

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

H = Highest Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

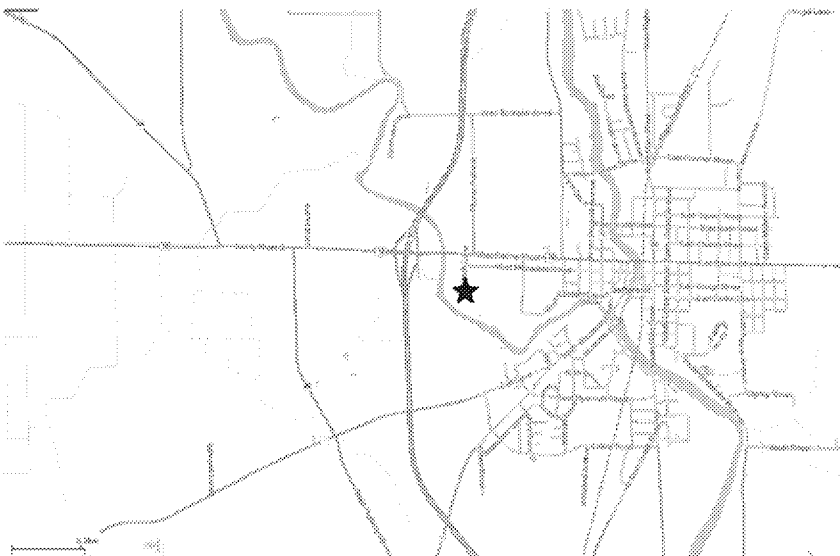
1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This site is at the end of Laatsch Lane and west of Jefferson Elementary School. The sample inlet is 4 meters above ground level and 90 meters from nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Kenosha – Water Tower

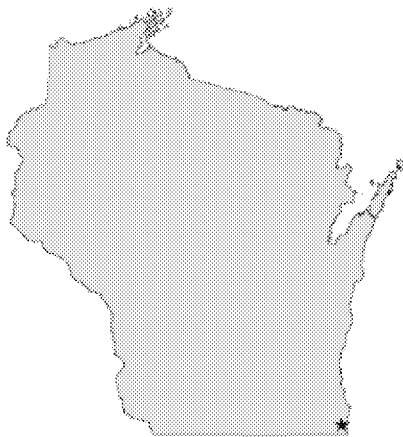
Site Information:

AQS Site ID: 55-059-0025

Address: 4504 64th Ave.

City: Kenosha

County: Kenosha



Operation: Seasonal

Latitude: 42.5960

Longitude: -87.8860

Year Established: 2013

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	S0								S0	S0	S0					
Monitor Objectives	P															

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

H = Highest Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

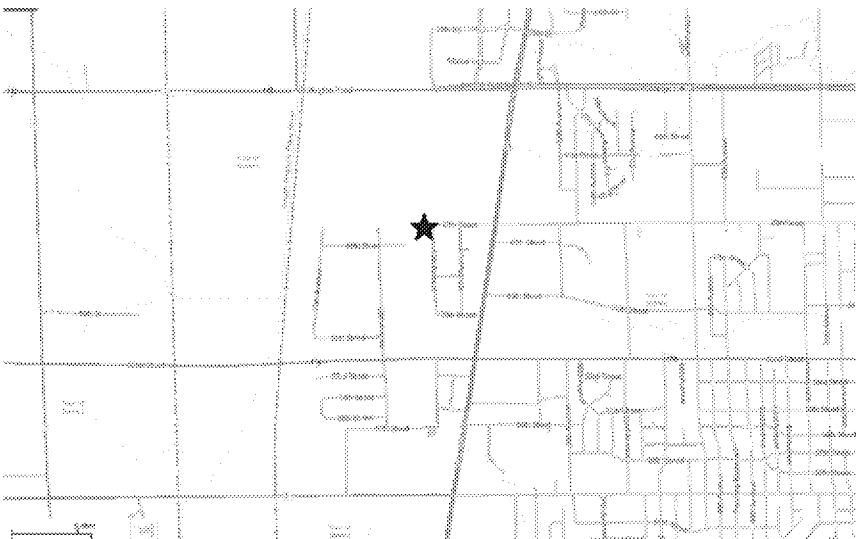
1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This site is located just east of Green Bay Road and north of the City of Kenosha. The sample inlet is 5 meters above ground level and 36 meters from the nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices A, C, D, E and G.



Kewaunee

Site Information:

AQS Site ID: 55-061-0002

Address: Route 1, Hwy 2

City: Kewaunee

County: Kewaunee



Operation: Seasonal

Latitude: 44.4431

Longitude: -87.5052

Year Established: 1994

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	SO															
Monitor Objectives	R&M															

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

H = Highest Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This site is located on a bluff over Lake Michigan next to ATV/ lawn tractor dealer. The sample inlet is 6 meters above ground level and 83 meters from nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Kohler

Site Information:

AQS Site ID: 55-117-0008

Address: 444 Highland Dr.

City: Kohler

County: Sheboygan



Operation: Year-round

Latitude: 43.7443

Longitude: -87.77645

Year Established: 2009

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors								Y6&12								
Monitor Objectives								SC&Q								

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

1 = Daily

12 = Every 12th Day

H = Highest Concentration

O = Other

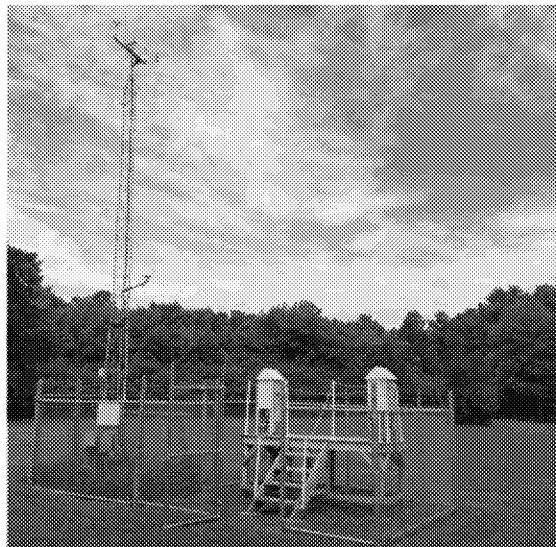
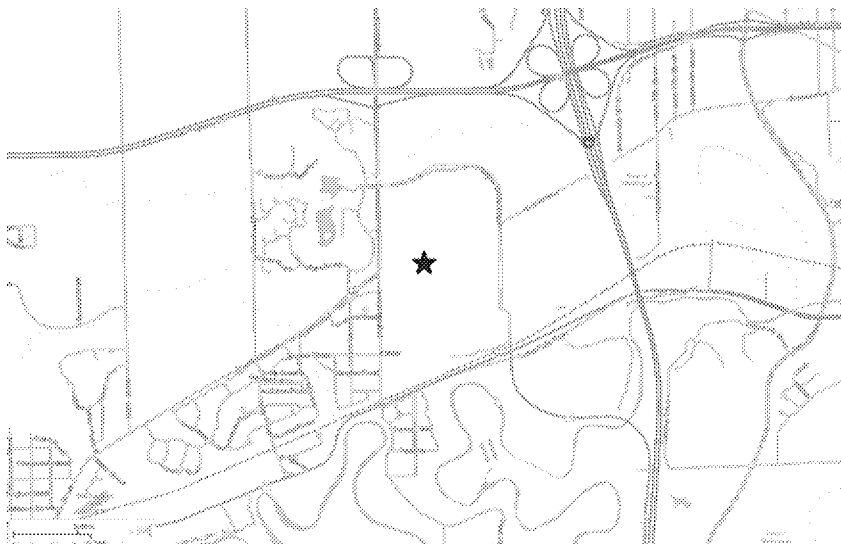
Q = Quality Assurance

SC = Source Oriented

3 = Every 3rd Day

30 = Monthly

Site Description: This source-oriented site is located at the Kohler Company fence line. The sample inlet is 2.4 meters above ground level and 175 meters from nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Planned Changes:

- Shutdown site.

La Crosse – DOT Building

Site Information:

AQS Site ID: 55-063-0012

Address: 3550 Mormon Coulee Rd.

City: La Crosse

County: La Crosse



Operation: Year-round

Latitude: 43.7775

Longitude: -91.2269

Year Established: 2005

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	SO	YO														
Monitor Objectives	M	H														

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

H = Highest Concentration

M = Max Ozone Concentration

O = Other

P = Population Exposure

Q = Quality Assurance

R = Regional Transport

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

1 = Daily

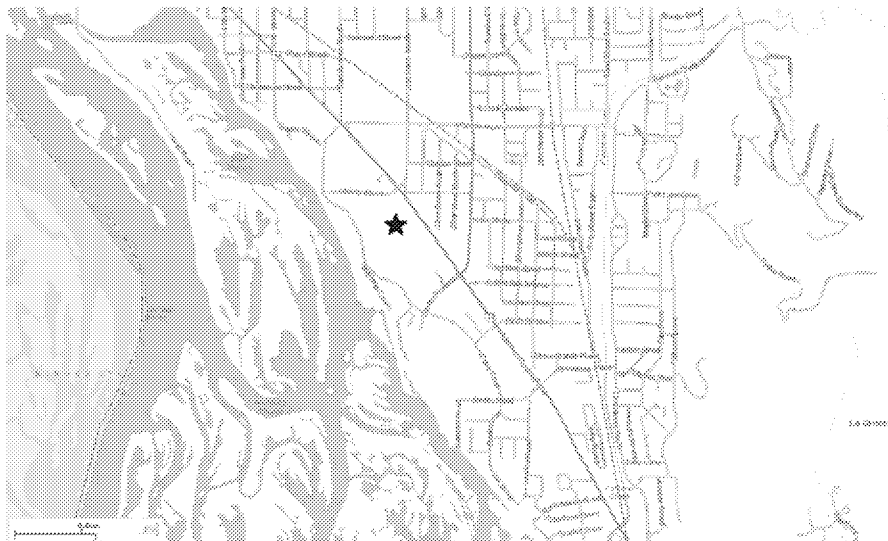
3 = Every 3rd Day

6 = Every 6th Day

12 = Every 12th Day

30 = Monthly

Site Description: This site is located on a Wisconsin Department of Transportation lot near an apartment complex. The sample inlets range from 5-6 meters above ground level and are 113 meters from nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Planned Changes:

- Replace BAM with Teledyne API T640 mass monitor.

Lake DuBay

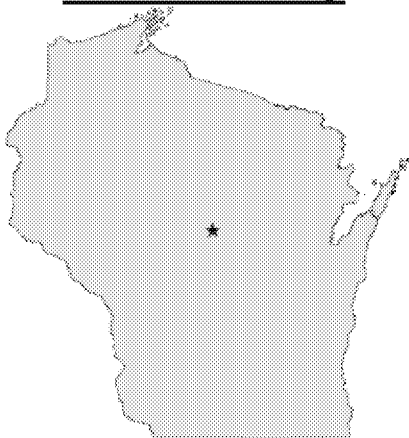
Site Information:

AQS Site ID: 55-073-0012

Address: 1780 Bergen Rd.

City: Bergen

County: Marathon



Operation: Seasonal

Latitude: 44.70735

Longitude: -89.77183

Year Established: 1991

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	S0															
Monitor Objectives	G															

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

H = Highest Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

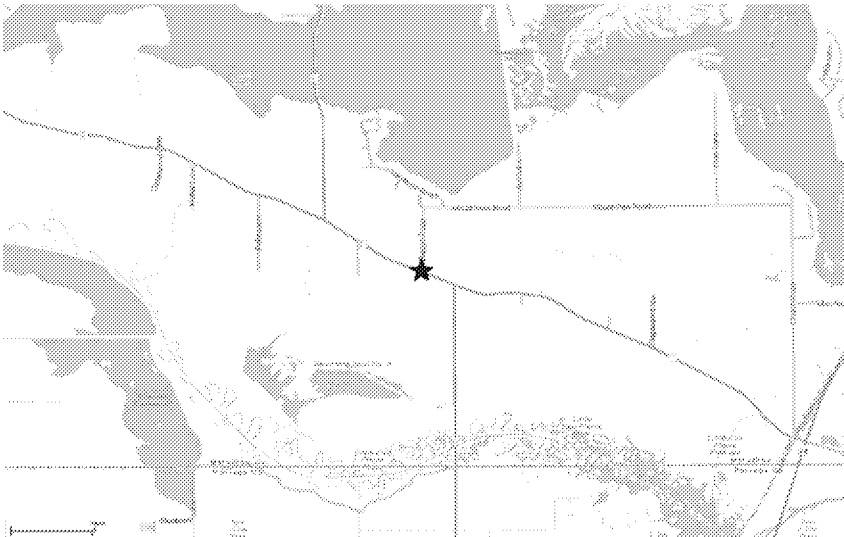
1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This site is located near Lake DuBay in Marathon County. The sample inlet is 5.4 meters above ground level and 16.8 meters from the nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Lake Geneva

Site Information:

AQS Site ID: 55-127-0005

Address: 2420 Elgin Club Rd.

City: Lake Geneva

County: Walworth



Operation: Seasonal

Latitude: 42.5800

Longitude: -88.4992

Year Established: 1987

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	S0								S0	S0	S0					
Monitor Objectives	R															

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

H = Highest Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This site is located on rural private property on the outskirts of the City of Lake Geneva. The sample inlet is 6 meters above ground level and 120 meters from nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.

Planned Changes:

- Move site.



Madison East

Site Information:

AQS Site ID: 55-025-0041

Address: 2302 Hoard St.

City: Madison

County: Dane



Operation: Year-round

Latitude: 43.1008

Longitude: -89.3572

Year Established: 1999

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	S0	Y0&Y6			Y0				Y0	Y0	Y0				S0	
Monitor Objectives	P	P&Q			P											

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

H = Highest Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This urban site is located next to the Madison East High School Sports Field. The sample inlets range from 5-6.1 meters above ground level and 43 meters from nearest public road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Planned Changes:

- Replace BAM with Teledyne API T640 mass monitor.

Madison University Avenue Well #6

Site Information:

AQS Site ID: 55-025-0047

Address: 2757 University Ave.

City: Madison

County: Dane



Operation: Year-round

Latitude: 43.0733

Longitude: -89.4358

Year Established: 1992

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors		Y6	Y6													
Monitor Objectives		H	P													

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

H = Highest Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

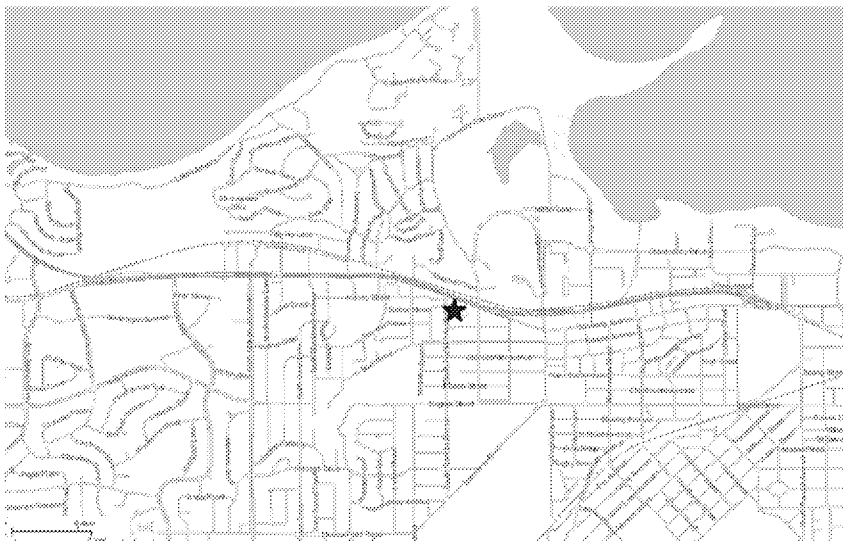
1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This urban site is located on top of a City of Madison building. The sampler inlets are 5 meters above ground level and 12 meters from nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Planned Changes:

- Replace FRM and HiVol with Teledyne API T640X mass monitor.

Manitowoc WdInd Dunes

Site Information:

AQS Site ID: 55-071-0007

Address: 2315 Goodwin Rd.

City: Two Rivers

County: Manitowoc



Operation: Seasonal

Latitude: 44.1386

Longitude: -87.6161

Year Established: 1994

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	S0					S0			S0	S0	S0					S0
Monitor Objectives	R					R										R

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

H = Highest Concentration

M = Max Ozone Concentration

O = Other

P = Population Exposure

Q = Quality Assurance

R = Regional Transport

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

1 = Daily

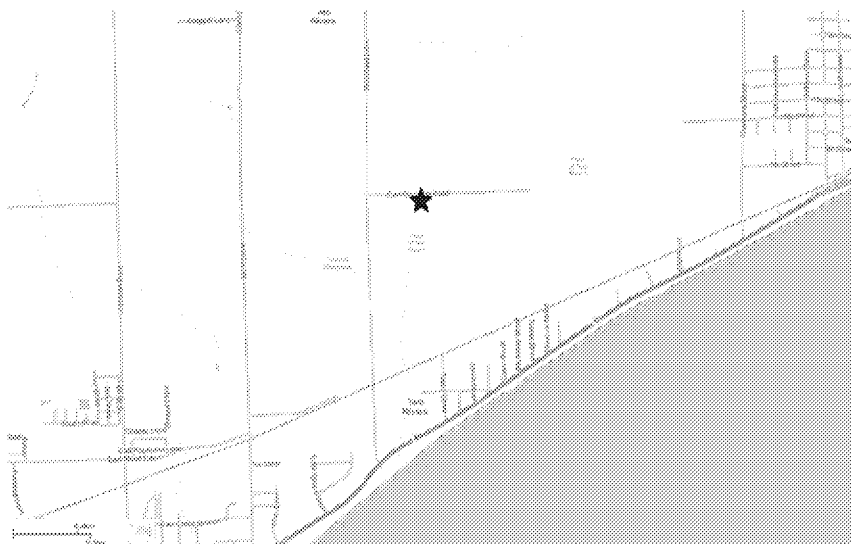
3 = Every 3rd Day

6 = Every 6th Day

12 = Every 12th Day

30 = Monthly

Site Description: This rural site is located at the Woodland Dunes Nature Center & Preserve in Two Rivers. The sample inlets range from 6-10 meters above ground level and 20 meters from nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Milwaukee – College Ave. NR

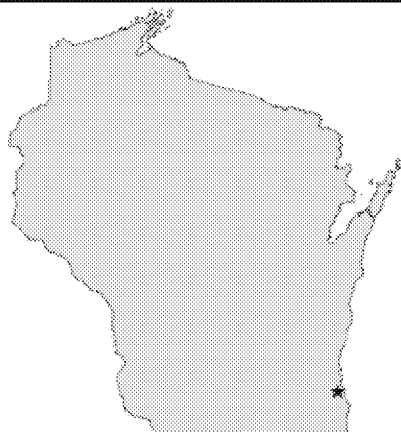
Site Information:

AQS Site ID: 55-079-0056

Address: 1550 W. College Ave.

City: Milwaukee

County: Milwaukee



Operation: Year-round

Latitude: 42.9326

Longitude: -87.9343

Year Established: 2013

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors		Y0				Y0	Y0		Y0	Y0	Y0					
Monitor Objectives		P				H	M									

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

H = Highest Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

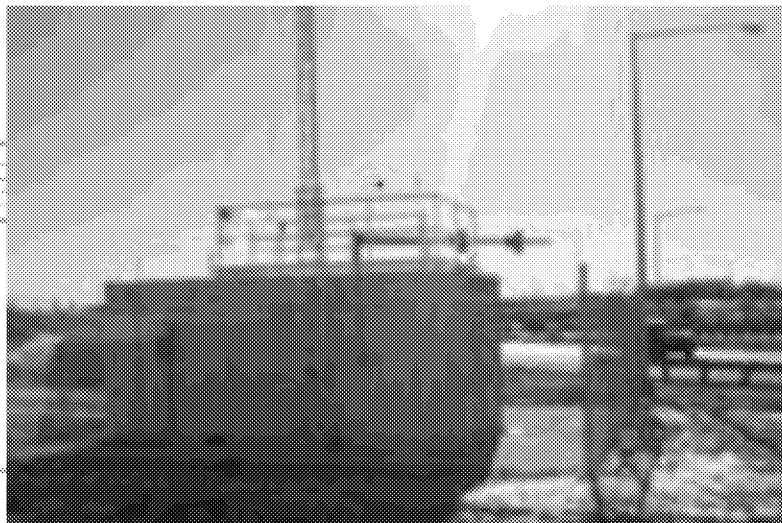
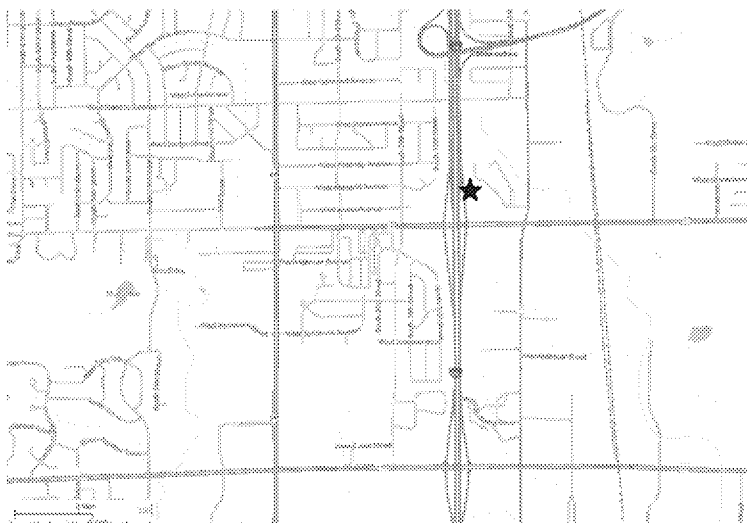
1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This urban site is located near the I-94 exit ramp at College Avenue in the Park and Ride area. The sample inlets are 5 meters above ground level and 14 meters from nearest road. Given its proximity to a major interstate, this site is influenced by transportation pollution sources. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Planned Changes:

- Replace BAM with Teledyne API T640X mass monitor.

Milwaukee College Ave. Park & Ride

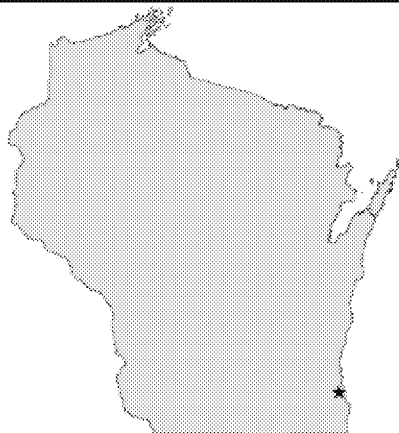
Site Information:

AQS Site ID: 55-079-0058

Address: 1550 W. College Ave.

City: Milwaukee

County: Milwaukee



Operation: Year-round

Latitude: 42.9306

Longitude: -87.9321

Year Established: 2009

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors		Y0	Y6&6													
Monitor Objectives		R	P&Q													

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

H = Highest Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

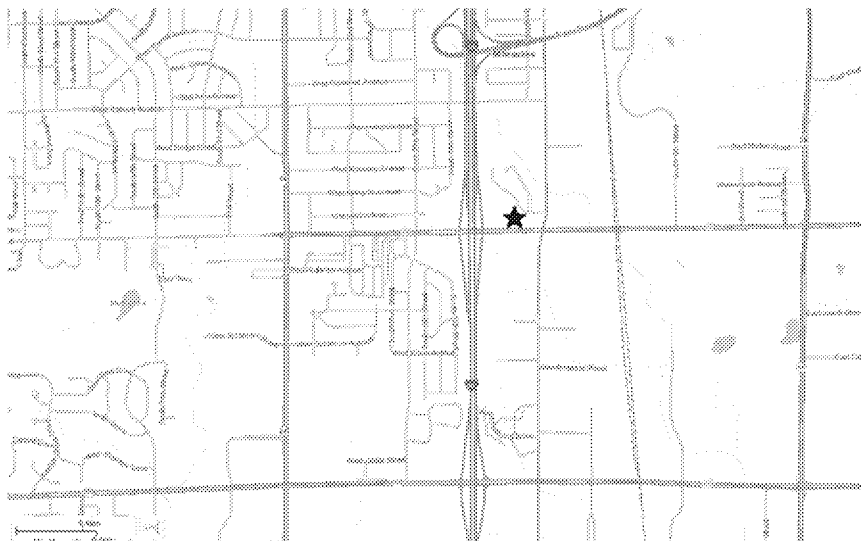
1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This urban site is located near the I-94 exit ramp at College Avenue in the Park and Ride area. The sample inlets range from 2.7-5.3 meters above ground level and are 30.5 meters from the nearest road. Given its proximity to a major interstate, this site is influenced by transportation pollution sources. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Planned Changes:

- Remove PM10 FRM monitors.

Milwaukee SER WDNr Hdqrs

Site Information:

AQS Site ID: 55-079-0026

Address: 2300 N. Martin Luther King Blvd.

City: Milwaukee

County: Milwaukee



Operation: Year-round

Latitude: 43.0610

Longitude: -87.9135

Year Established: 1999

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	Y0	Y0&6&6	Y0	Y0	Y0	Y0			Y0	Y0	Y0	Y0		Y0		S0
Monitor Objectives	P	P&P&Q	P	P	P	P										P

* Reported to National Weather Service

	Metals (PM ₁₀)	VOC/Carbonyl	PAH	Hg*	AMNet*	CSN	AMoN**	MDN***	NTN***	IMPROVE
Monitors				Y		Y				
Monitor Objectives				O						

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Sampling Frequencies:

0 = Continuous

1 = Daily

3 = Every 3rd Day

6 = Every 6th Day

12 = Every 12th Day

30 = Monthly

* For elemental Hg, samples are of 5 minutes duration. For speciation, Hg samples are two-hour samples with an hour of analysis between samples.

** NTN and MDN generate weekly composite samples.

*** AMoN generates two-week composite samples.

Objectives: G = General / Background

NA = Not Applicable

Q = Quality Assurance

H = Highest Concentration

O = Other

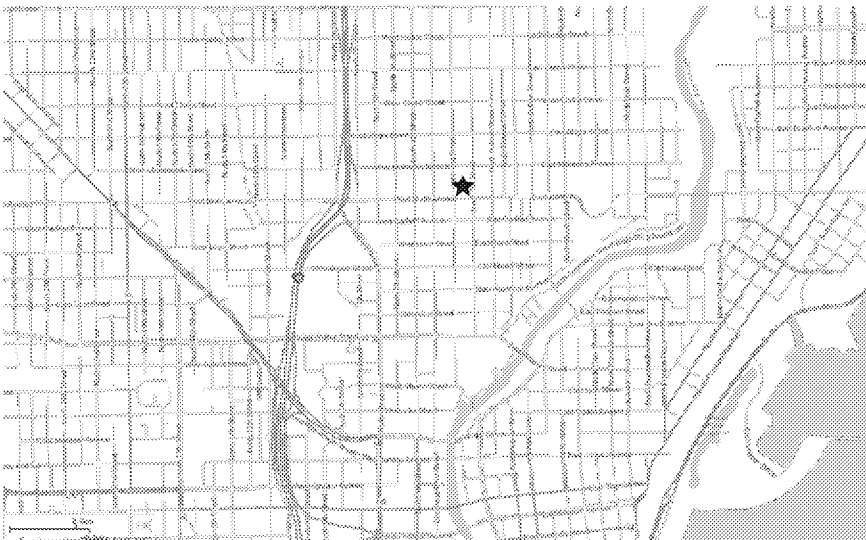
R = Regional Transport

M = Max Ozone Concentration

P = Population Exposure

SC = Source Oriented

Site Description: This urban site is located in the parking lot at WDNr Southeast Regional Headquarters located at 2300 N. Martin Luther King Blvd. Sample inlets are 10 meters above ground level and 12 meters from the nearest road. Verified through annual WDNr audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Planned Changes:

- Replace BAM with Teledyne API T640X mass monitor.

Milwaukee Sixteenth St. Health Center

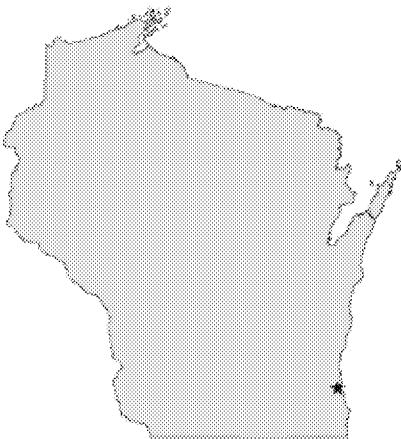
Site Information:

AQS Site ID: 55-0079-0010

Address: 1337 S. 16th St

City: Milwaukee

County: Milwaukee



Operation: Year-round

Latitude: 43.0167

Longitude: -87.9333

Year Established: 1997

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	O	Y0&6	Y6													
Monitor Objectives	P	H&Q	P													

* Reported to National Weather Service

A
S
T
Y

	Metals (PM ₁₀)	VOC/Carbonyl	PAH	Hg*	AMNet*	CSN	AMoN**	MDN***	NTN***	IMPROVE
Monitors	Y6	Y6		Y						
Monitor Objectives		G		O						

= Proposed to Add
= Seasonal
= Proposed to Terminate
= Year-round

Sampling Frequencies:

0 = Continuous
1 = Daily
3 = Every 3rd Day
6 = Every 6th Day
12 = Every 12th Day
30 = Monthly
90 = Quarterly

* For elemental Hg, samples are of 5 minutes duration. For speciation, Hg samples are two-hour samples with an hour of analysis between samples.

** NTN and MDN generate weekly composite samples.

*** AMoN generates two-week composite samples.

Objectives: G = General / Background
NA = Not Applicable
Q = Quality Assurance

H = Highest Concentration
O = Other
R = Regional Transport

M = Max Ozone Concentration
P = Population Exposure
SC = Source Oriented

Site Description: This urban site is located on the Health Center Building on S Cesar E. Chavez Dr. (16th St.) and Greenfield Ave. Sample inlets are 10 meters above ground level and 12 meters from the nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Planned Changes:

- Add PM10 FRM monitor.

Newport Park

Site Information:

AQS Site ID: 55-029-0004

Address: 475 CTH NP

City:

County: Door



Operation: Seasonal

Latitude: 45.2384

Longitude: -86.994

Year Established: 1989

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	S0								S0	S0	S0					
Monitor Objectives	R															

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

H = Highest Concentration

M = Max Ozone Concentration

O = Other

P = Population Exposure

Q = Quality Assurance

R = Regional Transport

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

1 = Daily

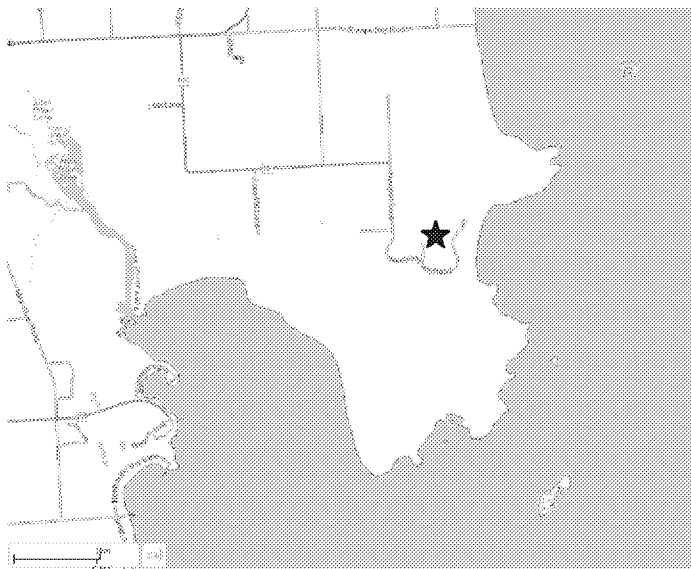
3 = Every 3rd Day

6 = Every 6th Day

12 = Every 12th Day

30 = Monthly

Site Description: This rural site is located inside the Newport State Park. The sample inlet is 12 meters above ground level and 250 meters from the nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Perkinstown

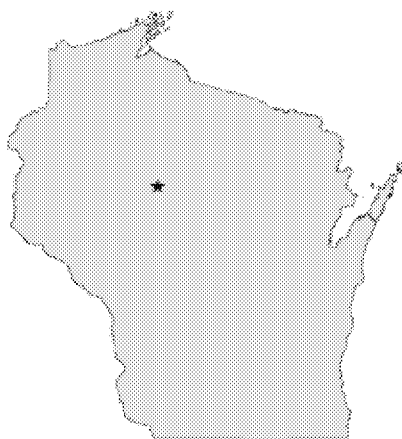
Site Information:

AQS Site ID: 55-119-8001

Address: W10746 Cty Rd. M

City: Taylor

County: Taylor



Operation: Year-round

Latitude: 45.2066

Longitude: -90.5972

Year Established: 1988

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors		Y0														
Monitor Objectives		G														

* Reported to National Weather Service

A
S
T
Y

	Metals (PM ₁₀)	VOC/Carbonyl	PAH	Hg*	AMNet*	CSN	AMoN**	MDN***	NTN***	IMPROVE
Monitors						Y				
Monitor Objectives										

= Proposed to Add
= Seasonal
= Proposed to Terminate
= Year-round

Sampling Frequencies:

0 = Continuous
1 = Daily
3 = Every 3rd Day
6 = Every 6th Day
12 = Every 12th Day
30 = Monthly
90 = Quarterly

* For elemental Hg, samples are of 5 minutes duration. For speciation, Hg samples are two-hour samples with an hour of analysis between samples.

** NTN and MDN generate weekly composite samples.

*** AMoN generates two-week composite samples.

Objectives: G = General / Background

NA = Not Applicable

Q = Quality Assurance

H = Highest Concentration

O = Other

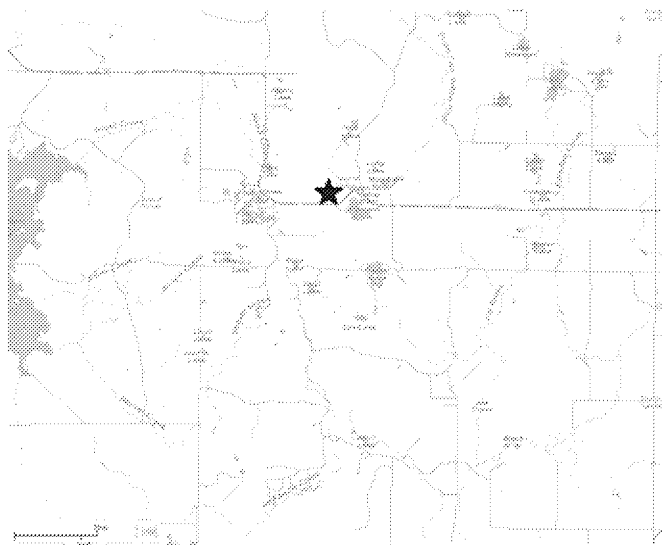
R = Regional Transport

M = Max Ozone Concentration

P = Population Exposure

SC = Source Oriented

Site Description: This site is located on private property 1 mile east of the town of Perkinstown. The sample inlets are 3 meters above ground level and 380 meters from the nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Planned Changes:

- Replace BAM with Teledyne API T640 mass monitor.

Potawatomi

Site Information:

AQS Site ID: 55-041-0007

Address: Fire Tower Rd.

City:

County: Forest



Operation: Year-round

Latitude: 45.5650

Longitude: -88.8086

Year Established: 2002

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	Y0	Y0			Y0				Y0	Y0	Y0		Y0	Y0		
Monitor Objectives	G	G			G											

* Reported to National Weather Service

A
S
T
Y

	Metals (PM ₁₀)	VOC/Carbonyl	PAH	Hg*	CSN	AMNet	AMoN	MDN	NTN	IMPROVE
Monitors				Y				Y	Y	Y
Monitor Objectives				G						

= Proposed to Add
 = Seasonal
 = Proposed to Terminate
 = Year-round
 Sampling Frequencies:
 0 = Continuous
 1 = Daily
 3 = Every 3rd Day
 6 = Every 6th Day
 12 = Every 12th Day
 30 = Monthly
 90 = Quarterly

* For elemental Hg, samples are of 5 minutes duration. For speciation, Hg samples are two-hour samples with an hour of analysis between samples.

** NTN and MDN generate weekly composite samples.

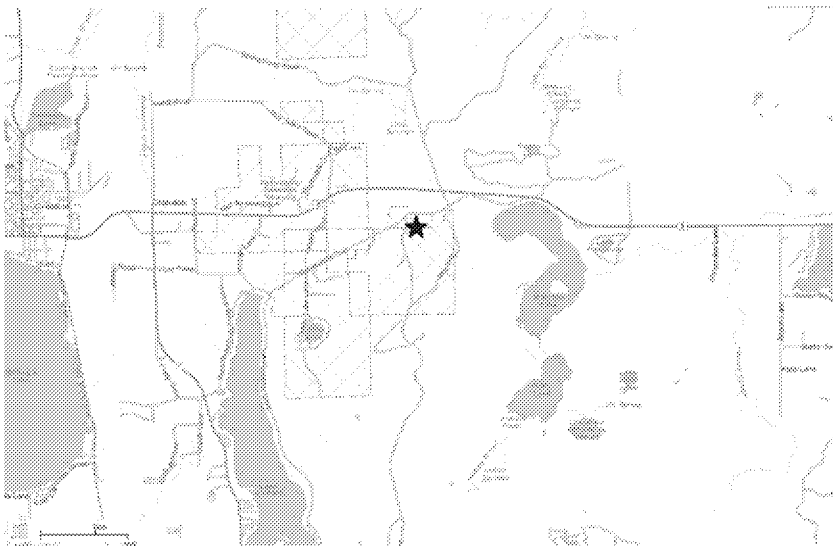
*** AMoN generates two-week composite samples.

Objectives: G = General / Background
 NA = Not Applicable
 Q = Quality Assurance

H = Highest Concentration
 O = Other
 R = Regional Transport

M = Max Ozone Concentration
 P = Population Exposure
 SC = Source Oriented

Site Description: This tribal site is located on the Forest County Potawatomi Community reservation. The sample inlets range from 2-6 meters above ground level and are 200 meters from the nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Potosi

Site Information:

AQS Site ID: 55-043-0009

Address: 128 Hwy 61

City:

County: Grant



Operation: Year-round

Latitude: 42.6930

Longitude: -90.6980

Year Established: 1999

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors		Y0														
Monitor Objectives		R														

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

H = Highest Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

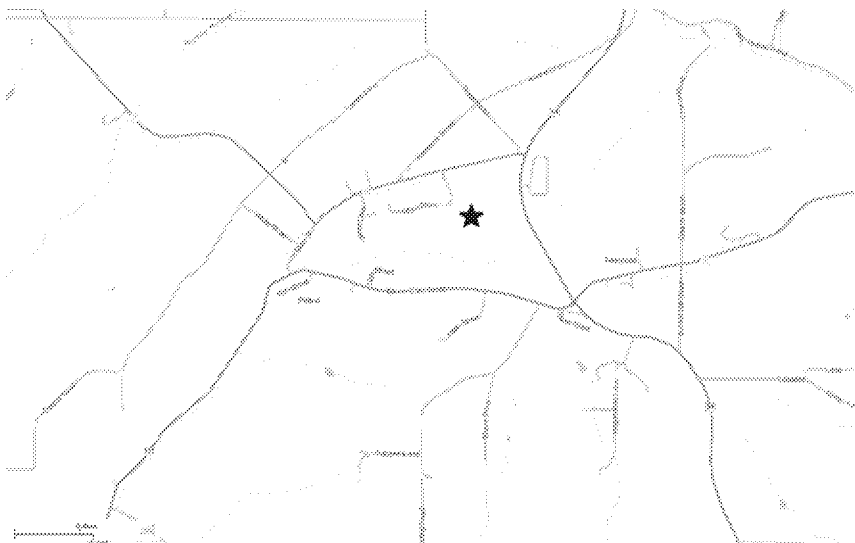
1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This site is located in Tennyson at the Potosi High School grounds. The sample inlets range from 5 meters above ground level and 100 meters from the nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Planned Changes:

- Replace BAM with Teledyne API T640 mass monitor.

Racine – Payne and Dolan

Site Information:

AQS Site ID: 55-101-0020

Address: 4227 Charles St.

City: Racine

County: Racine



Operation: Seasonal

Latitude: 42.773677

Longitude: -87.796306

Year Established: 2015

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	S0															
Monitor Objectives	M&R															

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

P = Population Exposure

R = Regional Transport

H = Highest Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This site is located in a farm field in the rural village of Caledonia. Verified through annual WDNR audits, the sample inlet is 5.2 meters above ground level and 20 meters from the nearest road. The site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Rhineland

Site Information:

AQS Site ID: 55-085-0996

Address: 434 High St.

City: Rhineland

County: Oneida



Operation: Year-round

Latitude: 42.64505

Longitude: -89.4185

Year Established: 1981

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors					Y0				Y0	Y0	Y0					
Monitor Objectives					H&SC											

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

H = Highest Concentration

NA = Not Applicable

P = Population Exposure

R = Regional Transport

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

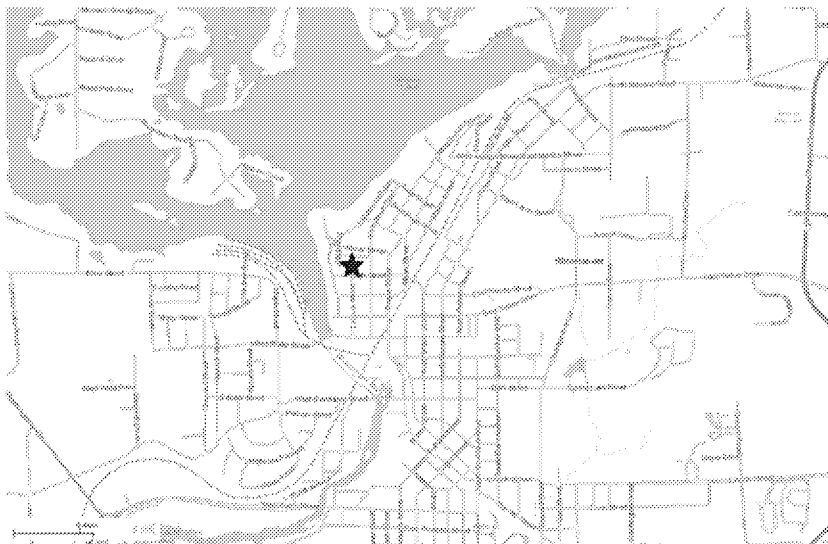
1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This site is located next to the Rhineland Water Tower on Lake and High Streets. The sample inlet is 5 meters above ground level and 30.5 meters from the nearest road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Sheboygan-Haven

Site Information:

AQS Site ID: 55-117-0009

Address: N7563 Hwy 42

City: Sheboygan

County: Sheboygan



Operation: Seasonal

Latitude: 43.8155955

Longitude: -87.792234

Year Established: 2014

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	S0								S0	S0	S0					
Monitor Objectives	P															

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

M = Max Ozone Concentration

O = Other

Q = Quality Assurance

SC = Source Oriented

H = Highest Concentration

NA = Not Applicable

P = Population Exposure

R = Regional Transport

Sampling Frequencies:

0 = Continuous

6 = Every 6th Day

1 = Daily

12 = Every 12th Day

3 = Every 3rd Day

30 = Monthly

Site Description: This site is located at a rural setting. The sample inlet is 5 meters above ground level and 61 meters from nearest public road. Verified through annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices A, C, D, E and G.



Trout Lake

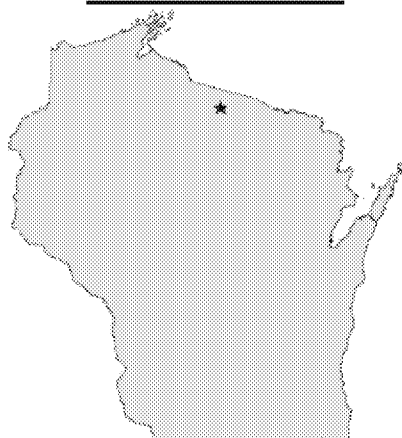
Site Information:

AQS Site ID: 55-125-0001

Address: 10810 County Hwy M

City: Boulder Junction

County: Vilas



Operation: Year-round

Latitude: 46.048

Longitude: -89.6530

Year Established: 2002

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	SO	YO														
Monitor Objectives	G	G														

* Reported to National Weather Service

	Metals (PM ₁₀)	VOC/Carbonyl	PAH	Hg*	CSN	AMNet	AMoN	MDN	NTN	IMPROVE
Monitors								Y	Y	
Monitor Objectives										

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Sampling Frequencies:

0 = Continuous

1 = Daily

3 = Every 3rd Day

6 = Every 6th Day

12 = Every 12th Day

30 = Monthly

90 = Quarterly

* For elemental Hg, samples are of 5 minutes duration. For speciation, Hg samples are two-hour samples with an hour of analysis between samples.

** NTN and MDN generate weekly composite samples.

*** AMoN generates two-week composite samples.

Objectives: G = General / Background

NA = Not Applicable

Q = Quality Assurance

H = Highest Concentration

O = Other

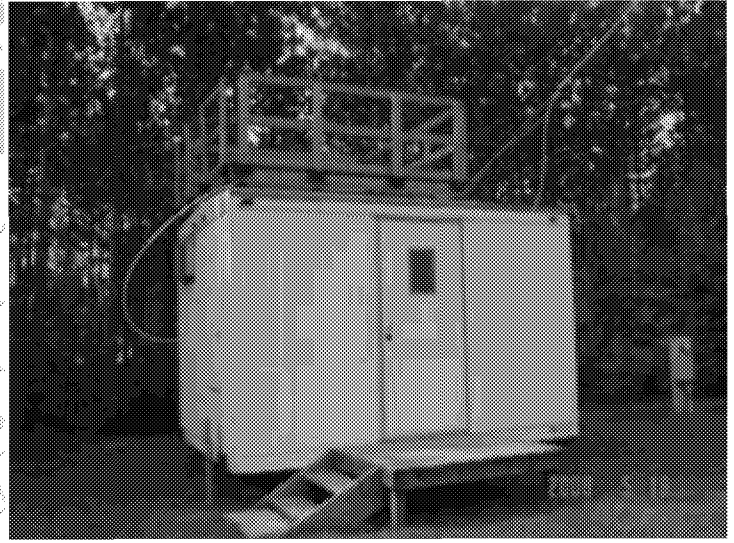
R = Regional Transport

M = Max Ozone Concentration

P = Population Exposure

SC = Source Oriented

Site Description: This rural site is located in a field at the DNR Forestry Site on County M, Boulder Junction. The sample inlets range from 5-6 meters above ground level and 36.5 meters from the nearest road. Verified through annual WDNR audits, the site meets the requirement of 40 CFR 58, Appendices C, D, E and G. annual WDNR audits, the site meets the requirements of 40 CFR 58, Appendices C, D, E and G.



Planned Changes:

- Replace BAM with Teledyne API T640 mass monitor.

Waukesha-Cleveland Ave.

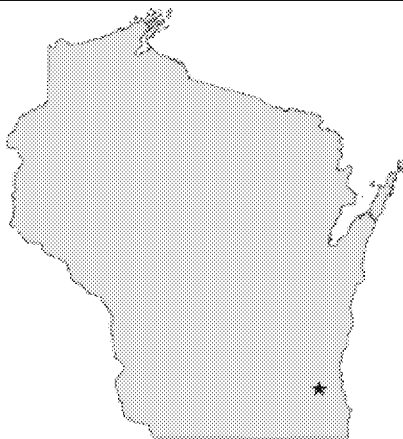
Site Information:

AQS Site ID: 55-133-0027

Address: 1310 Cleveland Ave.

City: Waukesha

County: Waukesha



Operation: Year-round

Latitude: 43.0203

Longitude: -88.2150

Year Established: 1989

Monitoring Parameters:

	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Pb-TSP	Wind Direction	Wind Speed	Temperature	Barometric Pressure	Relative Humidity	Solar Radiation	Precipitation*	NO _y
Monitors	S0	Y0,6	Y6						Y0	Y0	Y0	Y0				
Monitor Objectives	P	H&Q	H													

* Reported to National Weather Service

A = Proposed to Add

S = Seasonal

T = Proposed to Terminate

Y = Year-round

Objectives:

G = General / Background

H = Highest Concentration

M = Max Ozone Concentration

O = Other

P = Population Exposure

Q = Quality Assurance

R = Regional Transport

SC = Source Oriented

Sampling Frequencies:

0 = Continuous

1 = Daily

3 = Every 3rd Day

6 = Every 6th Day

12 = Every 12th Day

30 = Monthly

Site Description: This urban site is located in a fenced-in area on a city lot in Waukesha County. The sample inlets range from 2 to 6.7 meters above ground level and 6 meters from the nearest road. Verified through annual WDNR audits, the site meets the requirement of 40 CFR 58, Appendices C, D, E and G.



Planned Changes:

- Replace BAM and HiVol with two Teledyne API T640X mass monitors.

Appendix E:

Enhanced Ozone Monitoring Plan

Introduction

As required by 40 CFR Appendix D (5)(h), DNR is providing an enhanced ozone monitoring plan (EMP). Appendix D (5)(h) states, in part:

The EMP will include monitoring activities deemed important to understanding the O₃ problems in the state. Such activities may include, but are not limited to, the following:

- (1) Additional O₃ monitors beyond the minimally required under paragraph 4.1 of this appendix,*
- (2) Additional NO_x or NO_y monitors beyond those required under 4.3 of this appendix,*
- (3) Additional speciated VOC measurements including data gathered during different periods other than required under paragraph 5(g) of this appendix, or locations other than those required under paragraph 5(a) of this appendix, and*
- (4) Enhanced upper air measurements of meteorology or pollution concentrations.*

Overview

As part of its EMP, DNR plans to:

- Continue monitoring ozone concentrations at additional sites beyond those required.
- Continue monitoring ozone precursors (NO_x and VOCs) at additional monitors beyond those required.
- Analyze data from the 2017 Lake Michigan Ozone Study (LMOS 2017) and consider the results of the study in future regulatory submittals and modeling.
- Install upper air meteorology instrumentation

Taken together, this continued enhanced monitoring and analysis of the results from an extensive field study should provide significant additional insights into the mechanisms and dynamics of ozone formation and transport along Wisconsin's Lake Michigan lakeshore and help advance understanding of the ozone problems in the state.

Monitoring of ozone and ozone precursors beyond those required

DNR is conducting enhanced ozone monitoring at two sites located several miles inland from the Lake Michigan shoreline: Sheboygan Haven (55-117-0009) and Kenosha Water Tower (55-059-0025). These

sites are not required by EPA. DNR has been monitoring ozone at these locations since 2013 (Kenosha Water Tower) and 2014 (Sheboygan Haven) for the express purpose of better understanding the lakeshore impact on ozone concentrations along Lake Michigan's western coast. These sites are located 3.2 to 2.6 miles inland from monitors along the shoreline. Ozone concentration gradients have been extrapolated from the comparison of the two monitors. Additionally, DNR has been testing a mobile ozone monitoring platform, the goal of the mobile monitoring system is to better understand lakeshore gradients in WI.

Enhanced monitoring of ozone precursors

DNR currently monitors the concentrations of nitrogen oxides (NO_x and VOCs) at two locations: Milwaukee SER DNR Hdqrs (55-079-0026) and Manitowoc WdInd Dunes (55-071-0007). At the Milwaukee SER DNR Hdqrs site, a NO_x monitor (measuring NO, NO₂ and NO_x) operates year-round and an NO_y monitor (measuring NO, NO_y and NO_y-NO) is operated from June through August. At the Manitowoc WdInd Dunes site, NO_x and NO_y monitors are operated from June through August. Data from these monitors was originally part of the requirement for Photochemical Assessment Monitoring Stations (PAMS). They were used to determine ozone precursor concentrations at a designated urban area as well as a downwind site. Since EPA revised the PAMS requirements, DNR is not currently required to operate either of these monitors but is continuing to do so to provide additional information about the concentrations and dynamics of ozone precursors.

DNR monitors the concentrations of volatile organic compounds (VOCs) at two locations: Milwaukee Health Center (55-079-0010) and Horicon (55-027-0001). The Horicon monitor is required as part of the National Air Toxics Trends Stations network, but the monitoring at the Milwaukee Health Center site is part of the Urban Air Toxics Monitoring program (UATM). Data from these two DNR monitors are used to better understand the concentrations and dynamics of these compounds, which are both important ozone precursors and air toxics.

Analysis of LMOS 2017 data

The LMOS 2017 campaign was a collaborative, multi-agency field study of ozone chemistry and meteorology along the Wisconsin-Illinois Lake Michigan shoreline using a combination of aircraft, ground-based and ship-based measurements. The goal of the study was to better understand ozone formation and transport around Lake Michigan, in particular, why ozone concentrations are generally highest along the lakeshore and drop off sharply inland and why ozone concentrations peak in rural areas far from major emission sources. Field activities were conducted May 22 through June 22, 2017. The campaign was conducted by researchers from three federal agencies and five research universities, in collaboration with the Lake Michigan Air Directors Consortium.

Measurements during the LMOS 2017 campaign focused on the Lake Michigan shoreline between Sheboygan, WI and Chicago, IL. The measurements made are outlined in the table below. The monitoring conducted during the LMOS 2017 campaign thoroughly addresses all four types of measurement suggested in 40 CFR Appendix D (5)(h).

Summary of measurements made during the LMOS 2017 field campaign

Location	Measurement*
Ground Sites	
Spaceport Sheboygan	Remote sensing of meteorology <i>In situ</i> measurements of pollutants & meteorology
Zion, IL	Remote sensing of meteorology Detailed <i>in situ</i> chemical measurements Routine measurements of ozone
Various [†]	Remote sensing of pollutants and boundary layer height
Sheboygan transect	<i>In situ</i> measurements of ozone at four locations
Airborne Platforms	
Lakeshore region	Airborne remote sensing of NO ₂ (GeoTASO) Airborne remote sensing of clouds (AirHARP) Airborne <i>in situ</i> profiling of pollutants and meteorology
Shipboard Platform	
Lake Michigan	<i>In situ</i> measurements of pollutants and meteorology Remote sensing of pollutants and boundary later height
Mobile Platforms	
Northeast IL and Southeast WI	<i>In situ</i> measurements of pollutants (GMAP)
Grafton to Sheboygan	<i>In situ</i> measurements of ozone and meteorology

*NO₂ = nitrogen dioxide, GeoTASO = Geostationary Trace gas and Aerosol Sensor Optimization instrument, AirHARP = Airborne Hyper Angular Rainbow Polarimeter, GMAP = Geospatial Mapping of Pollutants.

[†] These measurements were made at Spaceport Sheboygan, Zion, two Wisconsin DNR monitoring locations (Grafton and Milwaukee SER) and one Illinois EPA monitoring location (Schiller Park).

DNR plans to analyze parts of the LMOS 2017 data set to better understand the origins and dynamics of the state's ozone challenges. DNR will also help facilitate the incorporation of this data into the state's conceptual model of ozone formation in the area. Analysis of monitoring data from this extensive field campaign should provide invaluable insight into the factors underlying Wisconsin's ozone challenges and will help support future regulatory submittals related to ozone.

Quality Assurance/Quality Control (QA/QC) Program

The purpose of the QA/QC program is to assure the quality of data obtained from the DNR air monitoring sites. The DNR meets or exceeds the QA requirements defined in 40 CFR 58 and all applicable appendices.

The QA/QC program includes but is not limited to the following activities:

- Instrument performance audits
- Monitor siting evaluations
- Zero, precision and span checks
- Bias determinations
- Flow rate audits
- Leak checks

- Data validation

As the Primary Quality Assurance Organization (PQAO) for ambient air monitoring activities in Wisconsin, the DNR operates under an EPA approved Quality Management Plan (QMP) and utilizes Quality Assurance Project Plans (QAPP) for each statewide monitoring network. The primary purpose of the QAPP is to provide an overview of the project, describe the need for the measurements, and define QA/QC activities to be applied to the project. All other ambient air monitoring initiatives including state, tribal, and industrial projects must have a DNR approved monitoring plan for each specific project.

As part of the instrument performance audit, each monitoring site is assessed to ensure that all applicable EPA siting requirements are fully met. This also includes a safety inspection to assure a safe work environment for site operators and staff and that monitoring stations are being properly maintained.

Data Processing and Reporting

Ambient air quality data are stored in a centralized server located at the Wisconsin Department of Administration. Continuous pollutant monitoring data are retrieved hourly and posted to the DNR Air Quality website (<https://airquality.wi.gov/StateMapping.aspx>) and sent to EPA's AirNow web site (https://airnow.gov/index.cfm?action=airnow.local_state&stateid=51&tab=1).

Network Changes

Changes to the Enhanced Ozone Monitoring Network are intended to improve the effectiveness of monitoring efforts and to ensure compliance with the EPA National Ambient Air Monitoring Strategy. Some changes are planned well in advance and are detailed in the Network Plan each year. This section of the document contains all changes that are planned for May 1, 2018 through December 31, 2019.

Some changes cannot be anticipated due to unforeseen circumstances including of severe weather, legislation, administrative directives, land-use and ownership changes, loss of funding, enforcement actions or complaints. If resources are available and state law is satisfied, DNR will attempt to revive the impacted site. If the site must be moved, DNR will attempt to find a nearby location satisfying all siting criteria that can replace the problematic site.

Proposed Network Changes (May 1, 2018 – December 31, 2019)

The only potential addition to the enhanced ozone monitoring network is a ceilometer.

Appendix F:

Planned and Actual Changes from the 2018 Air Monitoring Network Plan

Summary

Each annual network plan includes anticipated changes to the network since the last network plan during approximately the next eighteen months ending on December 31 of the year specified in the network plan title. Table 1 lists the planned and possible network changes from the 2018 Network Plan by parameter network. Table 2 lists the actual network changes that occurred through April 1, 2018 by parameter network.

Federal Regulation

Requirements to submit network change information are found in a number of places in 40 CFR including: §58.10(a)(2), §58.10(e), §58.10(b)(5), §58.14(a), §58.14(b) and §58.14(c).

Table of Contents

Table 1: Planned Network Changes from the 2017 Air Monitoring Network Plan	3
Table 2: Actual Network Changes from the 2017 Air Monitoring Network Plan	4

Table 1: Planned Network Changes from the 2018 Air Monitoring Network Plan

Monitoring Site	AQS Site ID	Site	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Carbon	Meteorological	Metals (PM ₁₀)	NOy	PCB	PAH	VOC / Carbonyl	Hg	AMNet	AMoN	MDN	NTN	IMPROVE
Appleton AAL	55-087-0009			T1																		
Bad River Tribal School – Odanah	55-003-0010																					
Chiwaukee Prairie Stateline	55-059-0019			T1																		
Columbus	55-021-0015																					
Devils Lake	55-111-0007																					
Eau Claire-DOT Sign Shop	55-035-0014																					
Expera - Kaukauna	55-087-0015																					
Green Bay East High	55-009-0005			M2																		
Harrington Beach	55-089-0009			T1																		
Horicon Wildlife Area	55-027-0001			M2																		
Kenosha-Water Tower	55-059-0025																					
Kohler	55-117-0008																					
La Crosse	55-063-0012			M2																		
Lake DuBay	55-073-0012																					
Madison - East	55-025-0041																					
Madison -University Ave. Well #6	55-025-0047			M2																		
Manitowoc Woodland Dunes	55-071-0007							M4														
Milwaukee College Ave. Park & Ride	55-079-0058			M5	M5	M5																
Milwaukee - College Ave. NR	55-079-0056							M4		A6												
Milwaukee SER DNR Hdqrs	55-079-0025			M5	M5	M5		M4		A6												
Milwaukee Sixteenth St. Health Center	55-079-0010											M2		T		M2						
Perkinstown	55-119-8001			T1																		

Monitoring Site	AQS Site ID	Site	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Carbon	Meteorological	Metals (PM ₁₀)	NOy	PCB	PAH	VOC / Carbonyl	Hg	AMNet	AMoN	MDN	NTN	IMPROVE
Potawatomi	55-041-0007			T1																		
Potosi	55-043-0009																					
Rhineland Tower	55-085-0996																					
Sheboygan-Haven	55-117-0009																					
Trout Lake	55-125-0001	V		T1&A3																		
Waukesha-Cleveland Ave.	55-133-0027			M2	M5	M5																

A = Addition
M = Modification
T = Termination
V = Move

1 = FRM
2 = Adjust sampling frequency
3 = FEM BAM
4 = Change the method for continuous NO₂ measurement to Cavity Attenuated Phase Shift Spectroscopy
5 = Collocate PM_{2.5}/PM₁₀ monitors using Broadband Spectroscopy.
6 = Aethalometer

Table 2: Actual Network Changes from the 2018 Air Monitoring Network Plan

Monitoring Site	AQS Site ID	Site	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Meteorological	Pb-TSP	Metals (PM ₁₀)	NO _y	PCB	PAH	VOC / Carbonyl	Hg	AMNet	AMoN	MDN	NTN	IMPROVE	Description
Appleton AAL	55-087-0009			M2&T1																			Termination of FRM in Sept 2017.
Bad River Tribal School – Odanah	55-003-0010																						
Chiwaukee Prairie Stateline	55-059-0019			M2&T1																			Termination of FRM in Sept 2017.
Columbus	55-021-0015																						
Devils Lake	55-111-0007			M3&T1																			Termination of both FRMs in Apr 2018.
Eau Claire-DOT Sign Shop	55-035-0014			M3&T1																			Termination of FRM in Apr 2018.
Expera Thilmany	55-087-0015																						
Green Bay East High	55-009-0005			M3&T1																			Termination of both FRMs in Apr 2018.
Harrington Beach	55-089-0009			M2&T1																			Termination of FRM in Sept 2017.
Horicon Wildlife Area	55-027-0001			M3																			
Kenosha-Water Tower	55-059-0025																						
Kohler	55-117-0008																						
La Crosse	55-063-0012			M3&T1																			Termination of FRM in Apr 2018.
Lake DuBay	55-073-0012																						
Madison - East	55-025-0041			M3																			
Madison -University Ave. Well #6	55-025-0047																						
Manitowoc Woodland Dunes	55-071-0007																						
Milwaukee College Ave. Park & Ride	55-079-0058			M3&T1																			Termination of FRM in Apr 2018.
Milwaukee - College Ave. NR	55-079-0056			M3,5&T1																			In Aug 2017, switched to NO ₂ (CAPS). Termination of FRM in Apr 2018.

Monitoring Site	AQS Site ID	Site	Ozone	PM _{2.5}	PM ₁₀	PM _{10-2.5}	SO ₂	NO ₂	CO	Meteorological	Pb-TSP	Metals (PM10)	NOy	PCB	PAH	VOC / Carbonyl	Hg	AMNet	AMoN	MDN	NTN	IMPROVE	Description
Milwaukee SER DNR Hdqrs	55-079-0025			M1&3																			Frequency of collocated FRM changed to 1 in 6 in Apr 2018.
Milwaukee Sixteenth St. Health Center	55-079-0010													T									Ended PCBs sampling in June 2017
Perkinstown	55-119-8001			M2&T1																			Termination of FRM in Sept 2017.
Potawatomi	55-041-0007			M2&T1																	A		Termination of FRM in Sept 2017. IMPROVE sampling began on Jan 1, 2018.
Potosi	55-043-0009																						
Rhineland Tower	55-085-0996																						
Sheboygan-Haven	55-117-0009																						
Trout Lake	55-125-0001			A4&T1																			Addition and termination occurred in Oct 2017
Waukesha-Cleveland Ave.	55-133-0027			M3&T1																			Termination of FRM in Apr 2018.

A = Addition

M = Modification or adjustment

T = Termination

1= FRM

2 = Designated FEM as primary in Sept 2017

3= Designated FEM as primary in Jan 2018

4 = BAM

5 = NO₂ monitor